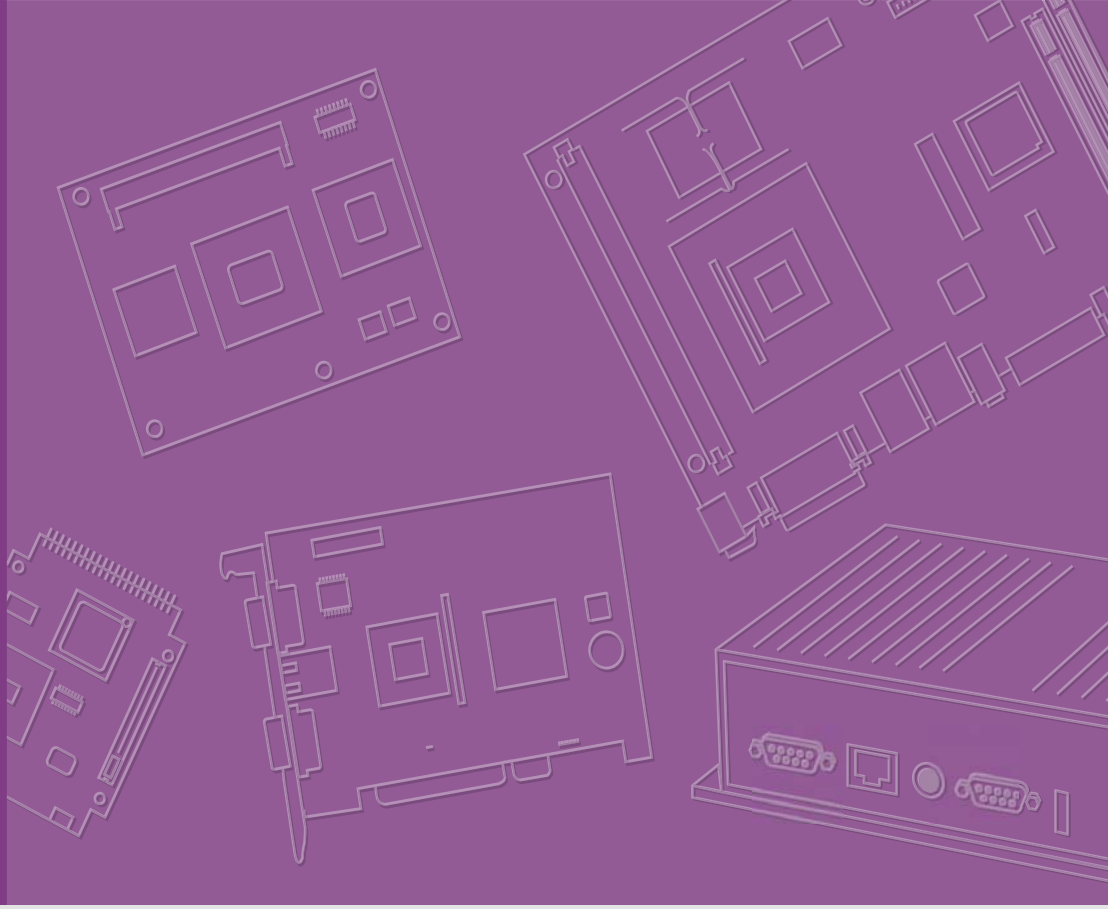

User Manual

AIMB-281

Intel® Core™ i7/i5/i3/Celeron LGA1155 Mini-ITX with CRT/DVI/ LVDS, 6 COM, Dual LAN, PCIe x4

ADVANTECH

Enabling an Intelligent Planet

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A Message to the Customer

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Every Advantech product is built with exact specifications to ensure reliable performance in the harsh and demanding conditions typical of industrial environments. Whether this Advantech equipment is destined for the laboratory or factory floor, be assured that your product will provide the reliability and ease of operation for which Advantech has become renowned.

Because your satisfaction is our primary concern, we have produced this guide to Advantech's customer services. To ensure you receive the full benefit of our services, please follow the instructions provided below.

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Declaration of Conformity

FCC Class B

This device complies with the requirements specified in Part 15 of the FCC Rules.

Operation is subject to the following two conditions:

- This device must not cause harmful interference.
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this device in a residential area is likely to cause harmful interference. In such cases, users are required to correct the interference at their own expense. Users are advised that any equipment changes or modifications not expressly approved by the party responsible for compliance will void the compliance with FCC Rules, and therefore, the user's authority to operate the equipment.

Caution! *Batteries may explode if incorrectly installed. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*

CPU Compatibility

Test Item	**Description**				
CPU Family	**Base Freq**	**Power**	**L3 Cache**	**Mfg Tech**	**Result**
Intel i5-3550	3.3GHz	77W	6MB	22nm	PASS
Intel i5-3570T	2.3GHz	45W	6MB	22nm	PASS
Intel i5-3550S	3.0GHz	65W	6MB	22nm	PASS
Intel i5-3450	3.1GHz	77W	6MB	22nm	PASS
Intel i5-3570K	3.4GHz	77W	6MB	22nm	PASS
Intel i5-2500T	2.3GHz	45W	6MB	32nm	PASS
Intel i7-3770T	2.5GHz	45W	8MB	22nm	PASS
Intel i7-3770S	3.1GHz	65W	8MB	22nm	PASS
Intel i7-3770	3.4GHz	77W	8MB	22nm	PASS
Intel i7-3770K	3.5GHz	77W	8MB	22nm	PASS
Intel i7-2600K	3.4GHz	95W	8MB	32nm	PASS
Intel i3-2125	3.3GHz	65W	3MB	32nm	PASS
Intel i3-3220	3.3GHz	55W	3MB	22nm	PASS
Intel Xeon E3-1275	3.4GHz	84W	8MB	22nm	PASS
Intel Xeon E3-1225	3.1GHz	95W	6MB	32nm	PASS
Intel Pentium G620	2.6GHz	65W	3MB	32nm	PASS
Intel Celeron G460	1.8GHz	35W	1.5MB	32nm	PASS

Memory Compatibility

Memory Module Information			
Item	**MEM-01**	**MEM-02**	**MEM-03**
Module Vendor	Transcend	Transcend	Transcend
Module P/N	TS1GSK64V3H	TS256MSK64V3N	TS256MSK64V6N
Chip Vendor	Micron	Hynix	Micron
Chip P/N	2AD27 D9PBC	H5TQ2G83CFR	IVM77 D9PFJ
Capacity	8 GB	2 GB	2 GB
Unbuffered/Regis-	Unbuffered	Unbuffered	Unbuffered
Type	SO DIMM	SO DIMM	SO DIMM
Speed	1333	1333	1600
ECC/Non-ECC	Non-ECC	Non-ECC	Non-ECC
Wide Temp Support	NIL	NIL	NIL
Device ID			

Memory Module Information			
Item	**MEM-04**	**MEM-05**	**MEM-06**
Module Vendor	ATP	DSL	DSL
Module P/N	AW24M64F8BLK0S	DDR3 1600 2GB CL11	DDR3 1333 4GB CL9
Chip Vendor	SEC	SEC	Elpida
Chip P/N	216 HYKO	113 HCK0	J4208BASE-DJ-F
Capacity	8 GB	2 GB	4 GB
Unbuffered/Regis-	Unbuffered	Unbuffered	Unbuffered
Type	SO DIMM	SO DIMM	SO DIMM
Speed	1600	1600	1066
ECC/Non-ECC	Non-ECC	Non-ECC	Non-ECC
Wide Temp Support	NIL	NIL	NIL
Device ID			

Memory Module Information			
Item	**MEM-07**	**MEM-08**	**MEM-09**
Module Vendor	Transcend	Kingston	ADATA
Module P/N	TS128MSK64V1U	KVR1333D3S8S9/2G	HY7YG1B16
Chip Vendor	Elpida	Elpida	Hynix
Chip P/N	J1108BDBG-DJ-F	J2108BCSE	H5TQ1G83BFR
Capacity	1 GB	2 GB	2 GB
Unbuffered/Regis-	Unbuffered	Unbuffered	Unbuffered
Type	SO DIMM	SO DIMM	SO DIMM
Speed	1066	1333	1066

ECC/Non-ECC	Non-ECC	Non-ECC	Non-ECC
Wide Temp Support	NIL	NIL	NIL
Device ID	SD3-039/040	SD3-126/127	SD3-087/088

Memory Module Information			
Item	**MEM-10**	**MEM-11**	**MEM-12**
Module Vendor	Innodisk	Innodisk	Transcend
Module P/N	M3SP-2GMJCL0C-M	M3SP-4GMJDL0C-M	JM1333KSN-2G
Chip Vendor	Micron	Micron	SpecTek
Chip P/N	IQM22 D9PFJ	IIM22 D9PFJ	PE901
Capacity	2 GB	4 GB	2 GB
Unbuffered/Regis-	Unbuffered	Unbuffered	Unbuffered
Type	SO DIMM	SO DIMM	SO DIMM
Speed	1600	1600	1333
ECC/Non-ECC	Non-ECC	Non-ECC	Non-ECC
Wide Temp Support	NIL	NIL	NIL
Device ID	SD3-142/143	SD3-145/146	SD3-116/117

Memory Module Information			
Item	**MEM-13**	**MEM-14**	**MEM-15**
Module Vendor	DSL	Panram	ADATA
Module P/N	DDR3 1333 2GB CL9	200D38G328,NB, K2BASESF	EL73I1B0873ZV
Chip Vendor	Elpida		Elpida
Chip P/N	J1108BDSE-DJ-F	F140X8A09481	J2108BCSE-DJ-F
Capacity	2 GB	8 GB	2 GB
Unbuffered/Regis-	Unbuffered	Unbuffered	Unbuffered
Type	SO DIMM	SO DIMM	SO DIMM
Speed	1333	1333	1333
ECC/Non-ECC	Non-ECC	Non-ECC	Non-ECC
Wide Temp Support	NIL	NIL	NIL
Device ID	SD3-019/020	SD3-140/141	SD3-132/133

Memory Module Information			
Item	**MEM-16**	**MEM-17**	**MEM-18**
Module Vendor	Kingston	PQI	Apacer
Module P/N	KVR1066D3S7/1G	MFCBR502SA0101	78.A2GC3.421
Chip Vendor	Kingston	Hynix	Elpida
Chip P/N	D1288JPNDPLD9U	H5TQ2G83AFR	J1108BDBG-DJ-F
Capacity	1 GB	4 GB	2 GB
Unbuffered/Regis-	Unbuffered	Unbuffered	Unbuffered

Type	SO DIMM	SO DIMM	SO DIMM
Speed	1066	1066	1066
ECC/Non-ECC	Non-ECC	Non-ECC	Non-ECC
Wide Temp Support	NIL	NIL	NIL
Device ID	SD3-064/065	SD3-075/076	SD3-027/028

Memory Module Information			
Item	**MEM-19**	**MEM-20**	**MEM-21**
Module Vendor	Kingston	hynix	Transcend
Module P/N	KVR1333D3S9/1G	HMT112S6TFR8C-H9	TS512MSK64V1N
Chip Vendor	Kingston	Hynix	Hynix
Chip P/N	D1288JPNDPLD9U	H5TQ1G83TFR	H5TQ2G83BFR
Capacity	1 GB	1 GB	4 GB
Unbuffered/Regis-	Unbuffered	Unbuffered	Unbuffered
Type	SO DIMM	SO DIMM	SO DIMM
Speed	1333	1333	1066
ECC/Non-ECC	Non-ECC	Non-ECC	Non-ECC
Wide Temp Support	NIL	NIL	NIL
Device ID	SD3-066/067	SD3-128/129	SD3-055/056

Memory Module Information			
Item	**MEM-22**	**MEM-23**	**MEM-24**
Module Vendor	Transcend	PQI	ADATA
Module P/N	TS256MSK64V6N	MFCBR402PA0105	AD73I1A0873EG
Chip Vendor	Micron	Hynix	ADATA
Chip P/N	IVM77 D9PFJ	H5TQ1G83BFR	AD3BC8A-13339H
Capacity	2 GB	2 GB	1 GB
Unbuffered/Regis-	Unbuffered	Unbuffered	Unbuffered
Type	SO DIMM	SO DIMM	SO DIMM
Speed	1600	1066	1333
ECC/Non-ECC	Non-ECC	Non-ECC	Non-ECC
Wide Temp Support	NIL	NIL	NIL
Device ID	SD3-151/152	SD3-077/078	SD3-123/124

*Use external VGA card to perform this test, DO NOT use on-board internal VGA.

Memory No.	Test Procedure	Result
MEM-01	System can boot up	Pass
	Check if BIOS can detect correct capacity and speed	Pass
	System can power on/off x 10	Pass
	Run Memtest86 for 3 loops	Pass
	Run Prime95 for 1 hour	Pass

Ordering Information

Part Number	Chipset	CRT	DVI	LVDS	GbE LAN	COM
AIMB-281G2-00A1E	H61	Yes	Yes	Yes	2	6

*() not populated on MP version.

Product Warranty (2 years)

Advantech warrants the original purchaser that all its products will be free from defects in materials and workmanship for two years from the date of purchase.

This warranty does not apply to any products that have been repaired or altered by persons other than the repair personnel authorized by Advantech, or that have been subject to misuse, abuse, accident, or improper installation. Advantech assumes no liability under the terms of this warranty as a consequence of such events.

Because of Advantech's high quality-control standards and rigorous testing, most customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, customers are billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details.

If you believe your product to be defective, please follow the steps outlined below.

1. Collect all information about the problem encountered. (For example, CPU speed, Advantech products used, other hardware and software used, etc.) Note anything abnormal and record any onscreen messages displayed when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any relevant information readily available.
3. If your product is diagnosed as defective, obtain an RMA (return merchandise authorization) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a completed Repair and Replacement Order card, and proof of purchase date (such as a photocopy of your sales receipt) in a shippable container. Products returned without a proof of purchase date are not eligible for warranty service.
5. Write the RMA number clearly on the outside of the package, then ship the package prepaid to your dealer.

Initial Inspection

Before installing the motherboard, please check to ensure that the following materials have been shipped:

- 1 x AIMB-281 mini-ITX motherboard
- 1 x driver CD
- 2 x COM cable (2 x 10 pin)
- 2 x SATA cable (2 in 1,7-pins)
- 1 x I/O shield
- 1 x startup manual
- 1 x warranty card

If any of the above items are missing or damaged, please contact your distributor or sales representative immediately. We have carefully inspected the AIMB-281 mechanically and electrically before shipment. The product should be free of marks and scratches and in perfect working order upon receipt. While unpacking, check the AIMB-281 device for signs of shipping damage (for example, damaged box, scratches, or dents). If the product is damaged or fails to meet the specifications, notify our service department or your local sales representative immediately. Also remember to notify the carrier. Retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the unit.

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Chapter 1

General Information

1.1 Introduction

AIMB-281 is designed with the Intel H61 for industrial applications that require both high-performance computing and enhanced power management capabilities. The motherboard supports Intel Core i7-3770 3.4 GHz/Core i5-3550S 3.0 GHz/Core i7-2600 3.4 GHz/Core i5-3570 2.3 GHz/Core i5-3450 3.1 GHz/Core i5-2500T 2.3 GHz/Core i3-2125 3.3 GHz/Core i3-3220 3.3 GHz/Xeon E3-1275 3.4 GHz/Xeon E3-1225 3.1 GHz/Pentium G620 2.6 GHz/Celeron G460 1.8 GHz processors, L3 cache of up to 8 MB, and DDR3 1066/1333/1600 memory up to 16 GB. AIMB-281 also offers rich I/O connectivity with 6 serial ports, 8 USB 2.0, dual GbE LAN, and 3 SATA II ports.

1.2 Features

- **Rich I/O Connectivity:** Dual GbE LAN via PCIe x 1 bus, 8 USB 2.0 ports, 6 serial ports, 1 mini PCIe, and 1 PCIe x 4.
- **Standard Mini-ATX Form Factor with Industrial Features:** The full-featured mini-ATX motherboard offers balanced expandability and performance.
- **Wide Selection of Storage Devices:** SATA HDD, customers benefit from the flexibility of suitable storage devices with a higher capacity.
- **Optimized Integrated Graphics Solution:** The Intel® Flexible Display Interface supports versatile display options and a 32-bit 3D graphics engine.

1.3 Specifications

1.3.1 System

- **CPU:** Intel Core i7-3770 3.4 GHz/Core i5-3550S 3.0GHz/Core i7-2600 3.4GHz/Core i5-3570 2.3 GHz/Core i5-3450 3.1 GHz/Core i5-2500T 2.3 GHz/Core i3-2125 3.3 GHz/Core i3-3220 3.3 GHz/Xeon E3-1275 3.4 GHz/Pentium G620 2.6 GHz/Celeron G460 1.8 GHz processor
- **BIOS:** AMI EFI 32 Mbit SPI BIOS
- **System Chipset:** Intel® H61
- **SATA Hard Disk Drive Interface:** Equipped with 3 on-board SATA connectors with a data transmission rate of up to 300 MB

1.3.2 Memory

- **RAM:** Supports up to 16 GB in two 204-pin DIMM sockets. Supports dual-channel DDR3 1066/1333/1600f MHz SDRAM.
  - Supports non-ECC unbuffered DIMMs. Does not support memory configurations that mix non-ECC with ECC unbuffered DIMMs.

Note! *A 32-bit OS may not detect the RAM when only 16 GB is installed.*

1.3.3 Input/Output

- **PCIe Slot:** One mini-PCIe expansion slot and one PCIe x4 expansion slot.
- **Parallel Port:** Configured to LPT1 or disabled. LPT1 supports EPP/SPP/ECP.
- **Serial Port:** Six serial ports, two RS-232 with hardware auto-flow control, and four RS-232.
- **PS/2 Mouse Connector:** One connector is located on the mounting bracket for easy connection to PS/2 keyboard and mouse.
- **USB Port:** Supports up to 8 USB 2.0 ports with transmission rates of up to 480 Mbps.
- **GPIO:** Supports 8-bit GPIO from super I/O for general purpose control applications.

1.3.4 Graphics

- **Controller:** Intel® HD Graphics
- **Display Memory:** Offers a maximum of 256 MB of shared memory when a minimum of 2 GB of system memory is installed
- **DVI:** Supports DVI up to 1920 x 1200 resolution @ 60Hz refresh rate
- **CRT:** Supports VGA up to 2048 x 1536 resolution @ 75Hz refresh rate
- **LVDS:** Supports LVDS up to 1920 x 1200 resolution

1.3.5 Ethernet LAN

- Supports dual 10/100/1000 Mbps Ethernet port (s) via PCI Express x1 bus, which provides a data transmission rate of 500 MB/s
- **Controller:** LAN 1: Realtek 8111E; LAN 2: Realtek 8111E

1.3.6 Industrial Features

- **Watchdog Timer:** Can generate a system reset. The watchdog timer is programmable, with each unit equal to one second or one minute (255 levels)

1.3.7 Mechanical and Environmental Specifications

- **Operating Temperature:** 0 ~ 60 °C (32 ~ 140 °F, depending on CPU)
- **Storage Temperature:** -20 ~ 70 °C (-4 ~ 158 °F)
- **Humidity:** 5 ~ 95% non-condensing
- **Power Supply Voltage:** +3.3 V, +5 V, +12 V, -12 V, 5 Vsb
- **Power Consumption:**

  Intel LGA1155 Core i7-2600 3.4 GHz, 8MB L3 cache, 2pcs 4GB DDR3 1600 MHz, +5V @1.38A, +3.3V @ 1.2A, +12V @ 7.25A, 5Vsb @ 0.15A, -12V @ 0.24A

  Measure the maximum current value with the system under maximum load (CPU: Top speed, RAM: Full loading)
- **Board Size:** 170 x 170 mm (6.69 x 6.69")
- **Board Weight:** 1.04 kg

1.4 Jumpers and Connectors

The AIMB-281 motherboard is equipped with connectors for integrating additional devices, such as hard disk drives and a keyboard. The board also features several jumpers for configuring the system to each application.

The function of every board jumper and connector is listed in the table below. Instructions for setting jumpers are provided in subsequent sections of this chapter. The procedure for connecting external devices to the motherboard is explained in Chapter 2.

Table 1.1: Jumpers

Label	Function	Note
JCMOS1	Clear CMOS	3 x 1 header, pitch 2.0 mm
JPSON	AT/ATX Mode Select	3 x 1 header, pitch 2.0 mm
JLVDS_BKL1	BL Select	3 x 1 header, pitch 2.0 mm
SelectCOM	SelectCOM	9 x 2 header, pitch 2.0 mm
SPI1		4 x 2 header, pitch 2.54 mm
JLPC		6 x 2 header, pitch 2.0 mm
LPT		13 x 2 header, pitch 2.54 mm

Table 1.2: Rear Panel Connector

Label	Function	Note
KBMS_USB	PS/2 KB/Mouse/2 USB 2.0	6-pin mini-Din
DVI	DVI Port	29-pin DVI-D port
VGA1	VGA Port	D-sub 15-pin, female
LAN1USB12	RJ-45 Ethernet Connector x 1 USB 2.0 Connector x 2	
LAN2USB34	RJ-45 Ethernet Connector x 1 USB 2.0 Connector x 2	
Audio1	Audio, Line-Out, Mic-In	

Table 1.3: Internal Connector

Label	Function	Note
CPU_FAN	CPU Fan Connector	4 x 1 wafer, pitch 2.54 mm
SYS_FAN1	System Fan Connector	3 x 1 wafer, pitch 2.54 mm
COM3~6	Pin Header Connector * 2	10 x 2 header, pitch 2.0 mm
JDIO	GPIO Connector	5 x 2 header, pitch 2.0mm
F_PANEL1	Intel Front Panel Connector	5 x 2 header, pitch 2.54mm
EATXPWR	EATX Power Connectors	12 x 2 header
FPAUD1	Audio Mic-In and Line-Out Connector	5 x 2 header, pitch 2.54 mm
JLVDS	24-bit LVDS Connector	2 x 20 connector
JBKL	LCD Inverter Connector	1 x 5 connector
SATA1 ~ 3	SATA Data Connector * 3	7P male connector
ATX12V	ATX Power Connector	2 x 2 pin power connector
USB78	USB Connector * 1	5 x 2 header, pitch 2.0 mm

1.5 Board Layout: Jumper and Connector Locations

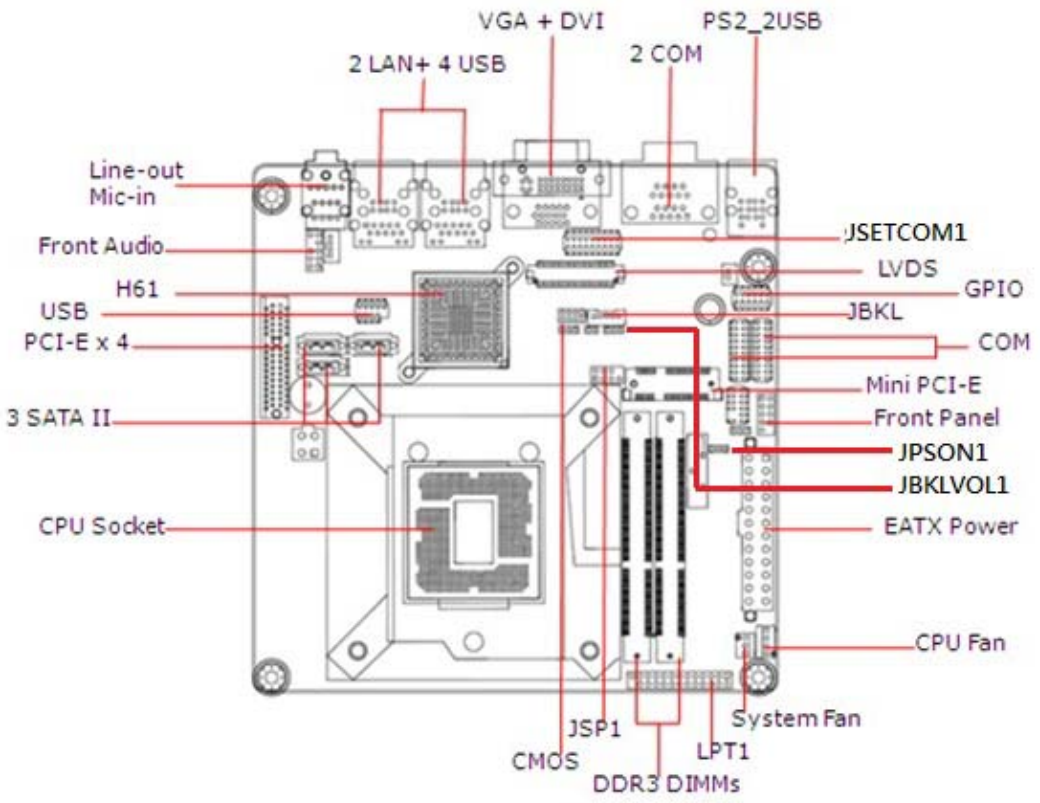


Figure 1.1 Jumper and Connector Locations

Figure 1.2 I/O Connectors

1.6 AIMB-281 Board Diagram

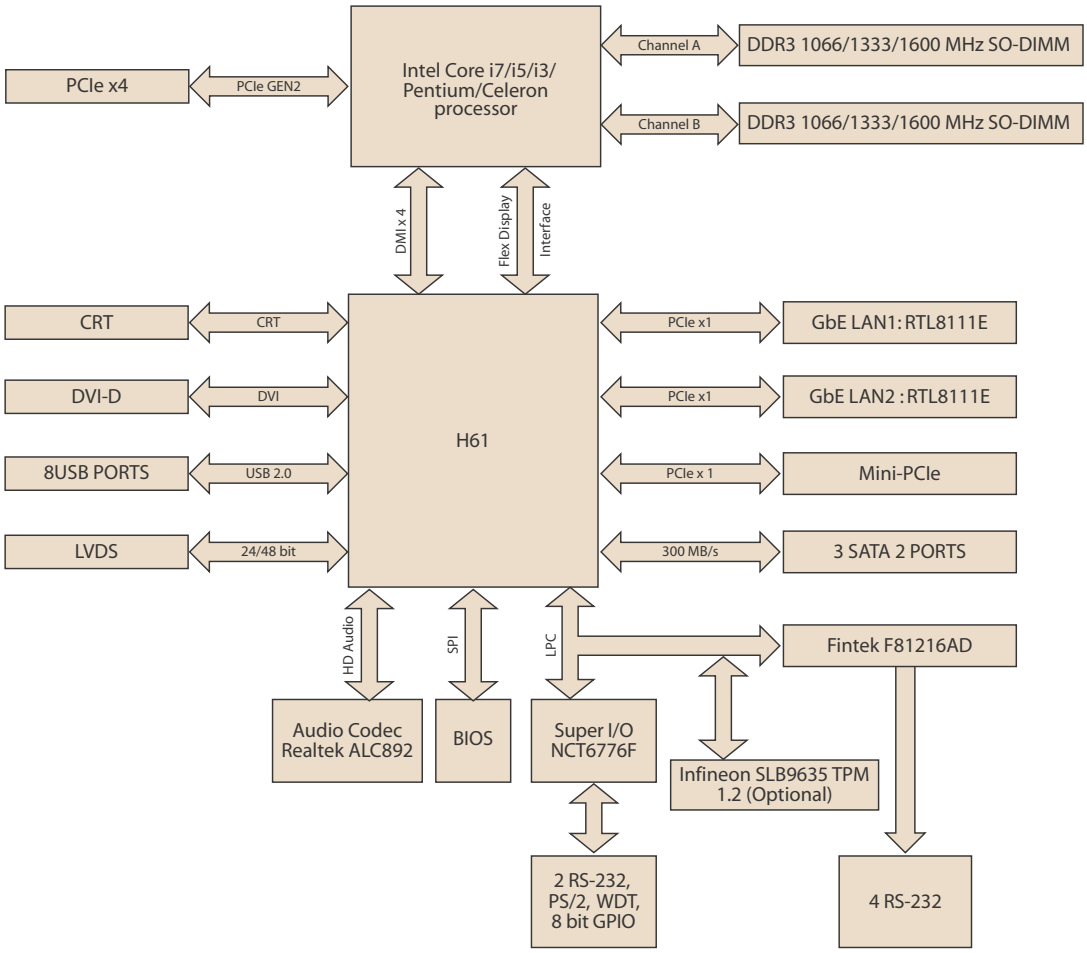


Figure 1.3 AIMB-281 Block Diagram

1.7 Safety Precautions

Warning! *Always disconnect the power cord from the chassis before working on the hardware. Do not reconnect cords while the power is on. Sensitive electronic components can be damaged by sudden power surges. Only experienced electronics personnel should open the PC chassis.*

Caution! *Always ground yourself to remove any static charge before touching the motherboard. Modern electronic devices are very sensitive to electro-static discharges. As a safety precaution, use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when not in the chassis.*

Caution! *The computer is equipped with a battery-powered real-time clock circuit. Batteries are at risk of exploding if incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*

Caution! *New batteries may explode if handled incorrectly. Do not attempt to recharge, force open, or heat the battery. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.*

1.8 Jumper Settings

This section provides instructions on how to configure the motherboard by setting the jumpers. The default motherboard settings and options for each jumper are also explained.

1.8.1 How to Set Jumpers

Users can configure the motherboard according to specific application requirements by setting the jumpers. A jumper is a metal bridge used to close an electrical circuit. Jumpers consist of two metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To “close” (or turn ON) a jumper, connect the pins with the clip. To “open” (or turn OFF) a jumper, remove the clip. Some jumpers consist of three pins labeled 1, 2, and 3. In such cases, connect either Pins 1 and 2, or Pins 2 and 3. A pair of needle-nose pliers may be necessary for setting jumpers.

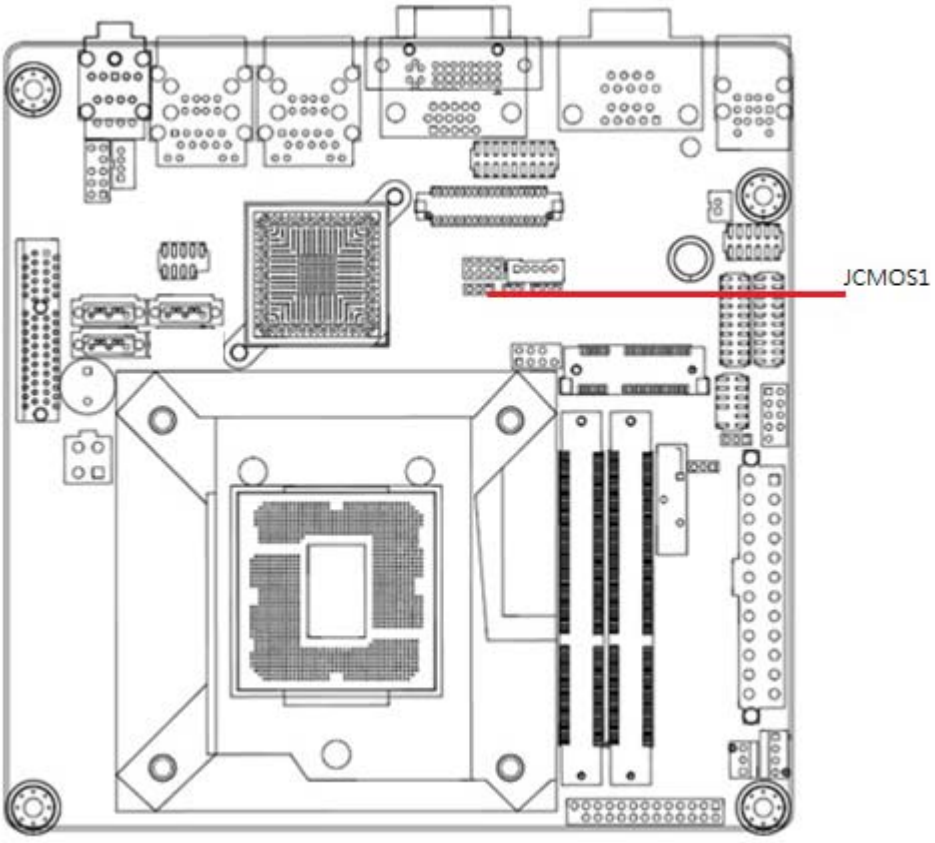
1.8.2 Clear CMOS (JCMOS1)

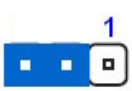
This jumper allows users to clear the Real-Time Clock (RTC) RAM in CMOS. The CMOS memory can be cleared of the date, time, and system setup parameters by erasing the CMOS RTC RAM data. The onboard button cell battery powers the RAM data in CMOS, which includes system setup information such as system passwords.

To erase the RTC RAM, follow the instructions outlined below.

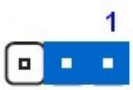
1. Turn off the computer and unplug the power cord.
2. Remove the onboard battery.
3. Move the jumper cap from Pins 1-2 (default) to Pins 2-3. Leave the cap on Pins 2-3 for approximately 5~10 seconds, before moving the cap back to Pins 1-2.
4. Reinstall the battery.
5. Plug in the power cord and turn the computer on.
6. Hold down the <Del> key during the boot process and enter BIOS setup to re-enter data.

Note! *Except when clearing the RTC RAM, never remove the cap on the CLRTC jumper from its default position. Removing the cap will cause a system boot failure!*





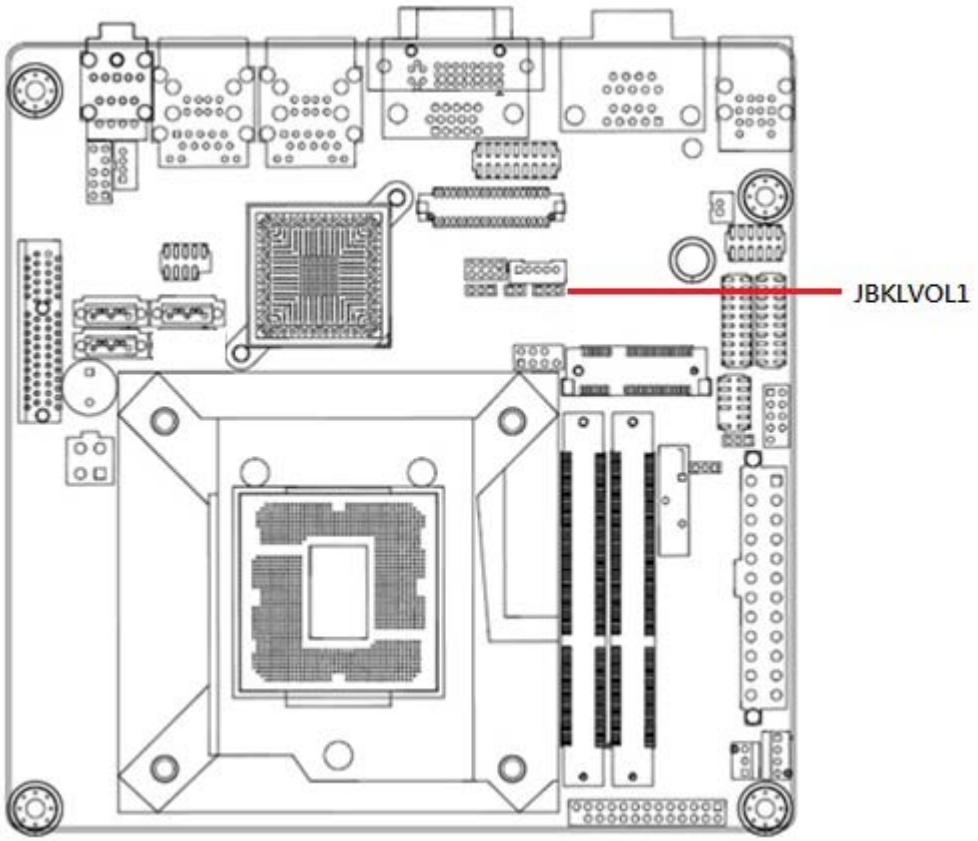
Normal (Default)



Clear CMOS

Note! *The RTC does not need to be cleared when the system hangs because of overclocking. For system failures due to overclocking, use the C.P.R. (CPU Parameter Recall) feature. Shut down and reboot the system to allow the BIOS to automatically reset the parameter settings to their default values.*

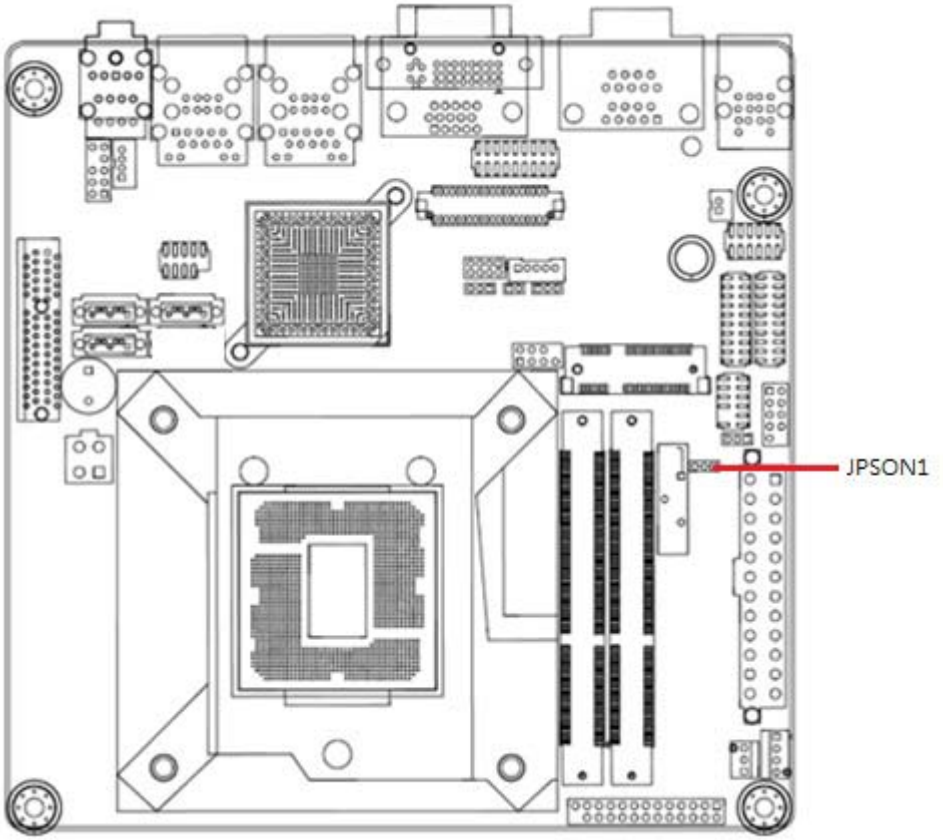
1.8.3 LVDS Back Light Power Selection



+5 V +3.3 V

1.8.4 AT/ATX Power Mode Select (JPSON)

This jumper allows users to select between ATX or AT mode.



ATX Mode (Default)

AT Mode

1.9 System Memory

AIMB-281 features two 204-pin memory sockets for 1066/1333/1600 MHz memory modules with a maximum capacity of 16 GB (a maximum of 8 GB for each DIMM). However, AIMB-281 supports only non-ECC DDR3 memory modules.

1.10 Memory Installation Procedures

To install DIMMs, first ensure that the two handles of the DIMM socket are in the “open” position, specifically, the handles lean outward. Slowly slide the DIMM module along the plastic guides on both ends of the socket. Then firmly but gently (avoid pushing too hard) press the DIMM module into the socket until you hear a clicking sound indicating that the two handles have automatically locked the memory module into the correct position on the DIMM socket. To remove the memory module, simply push both handles outward, and the memory module will be automatically ejected.

1.11 Cache Memory

AIMB-281 supports a CPU with one of the following built-in full speed L3 caches:

8 MB for Intel Core i7-3770

6 MB for Intel Core i5-3550

3 MB for Intel Core i3-3220

8 MB for Intel Core i7-2600

6 MB for Intel Core i5-3570

3 MB for Intel Core i3-2125

6 MB for Intel Core i5-3450

6 MB for Intel Core i5-2500

8 MB for Intel Xeon E3-1275

6 MB for Intel Xeon E3-1225

3 MB for Intel Pentium G620

1.5 MB for Intel Celeron G460

The built-in second-level cache in the processor yields a substantially superior performance compared to conventional external cache memories.

1.12 Processor Installation

AIMB-281 is designed for an LGA1155, Intel Core i7/Core i5/Core i3/Pentium/Celeron processor.

Chapter 2

Connecting Peripherals

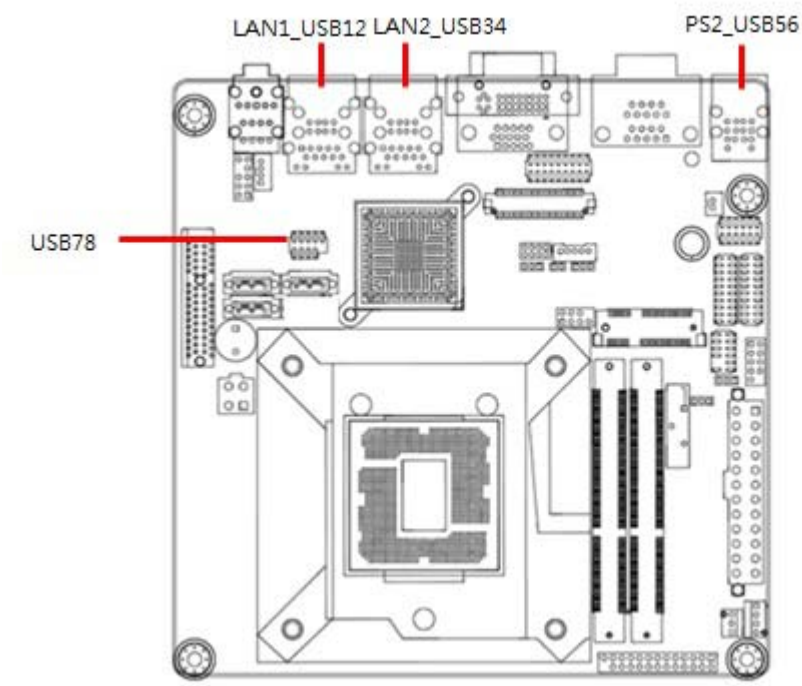
2.1 Introduction

Most of the connectors can be accessed from the top of the board when installed in the chassis. If several cards have been installed or the chassis is full, the card may need to be partially removed in order to make connections.

2.2 USB Ports

AIMB-281 supports up to 8 USB ports. The USB interface complies with USB Specification Rev 2.0 in supporting transmission rates of up to 480 Mbps. The USB interface can be disabled during the system BIOS setup.

AIMB-281 is equipped with two high-performance 1000 Mbps Ethernet LAN adapters; both of which are supported by all major network operating systems. The RJ-45 jacks on the rear panel offer convenient LAN connections.



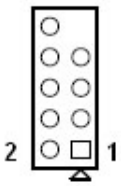
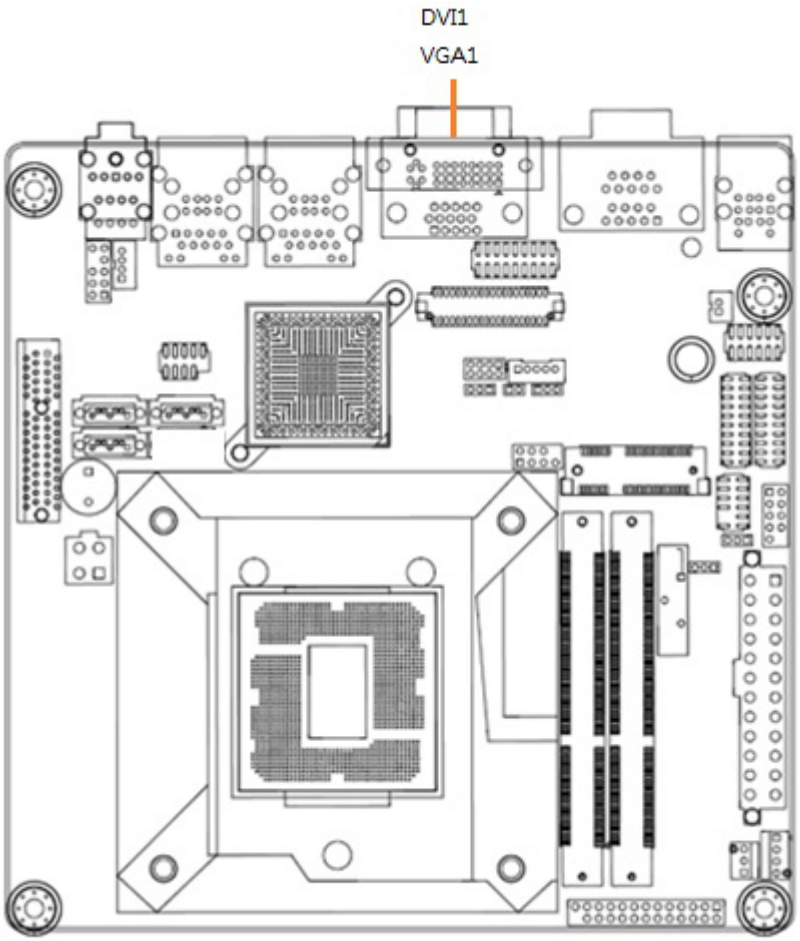


Table 2.1: Pin Definitions (USB78)			
Pin	**Signal**	**Pin**	**Signal**
1	USB+5 V	2	USB+5 V
3	USB	4	USB-
5	USB+	6	USB+
7	GND	8	GND
9	NC		

2.3 VGA/DVI-D Connector



AIMB-281 is equipped with VGA and DVI interfaces that can drive conventional VGA and DVI displays. The VGA connector is a standard 15-pin D-SUB connector commonly used for VGA.

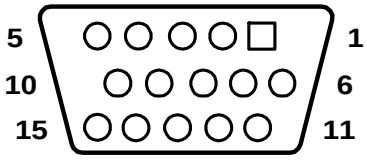


Table 2.2: VGA Connector (VGA1)			
Pin	**Signal**	**Pin**	**Signal**
1	RED	9	CRT_VCCIN
2	VGA_G	10	GND
3	VGA_B	11	N/C
4	N/C	12	V_SDAT
5	GND	13	H-SYNC
6	GND	14	V-SYNC
7	GND	15	V_SCLK

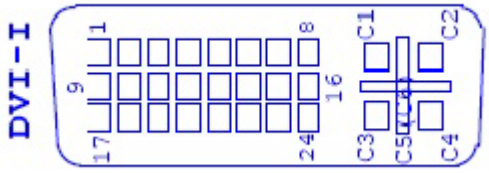
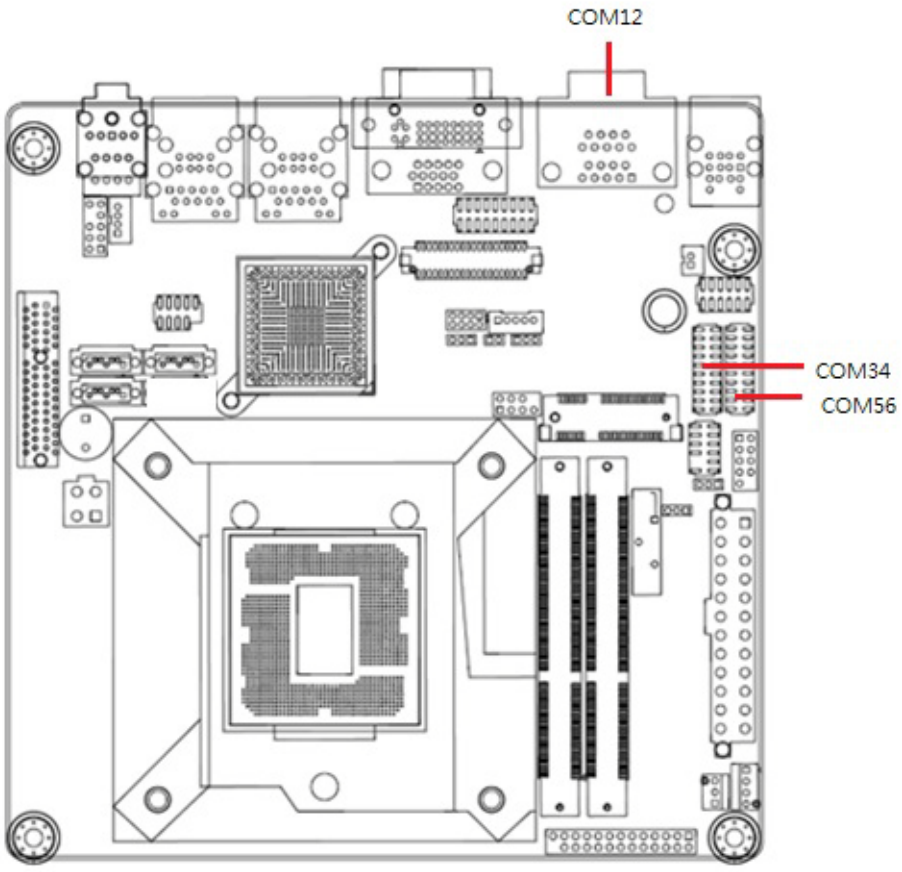


Table 2.3: DVI Connector (DVI1)	
Pin	**Signal**
1	TMDS2-
2	TMDS2+
3	TMDS_2/4_Shield
4	TMDS4-
5	TMDS4+
6	DDC_CLK
7	DDC_DATA
8	VSYNC
9	TMDS1-
10	TMDS1+
11	TMDS_1/3_Shield
12	TMDS3-
13	TMDS3+
14	VCC
15	GND
16	HOTPLUG_DETECT
17	TMDS0-
18	TMDS0+
19	TMDS_0/5_Shield
20	TMDS5-
21	TMDS5+

Table 2.3: DVI Connector (DVI1)	
22	TMDSCLK_Shield
23	TMDSCLK+
24	TMDSCLK-
C1	RED
C2	GREEN
C3	BLUE
C4	HSYNC
C5	AGND_1
C6	AGND_2

2.4 Serial Ports (COM12 ~ COM56)



AIMB-281 supports six serial ports. COM34 and COM56 support RS-232. COM12 supports RS-232/422/485 (supports RS-485 auto flow control).

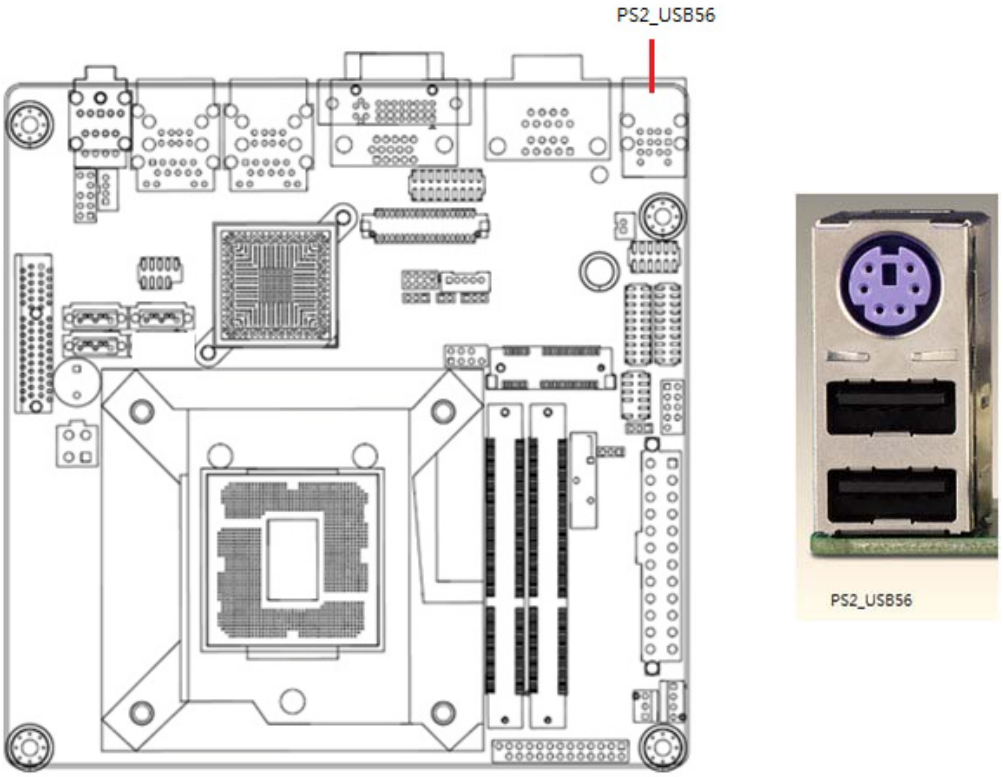
These ports can be used to connect serial devices, such as a mouse or printer, or to a communications network.

The IRQ and address ranges for both ports are fixed. However, users can disable the port or change the parameters via the system BIOS setup.

Various devices implement the RS-232 standards in differing ways. If users encounter problems with a serial device, check the pin assignments for the connector.

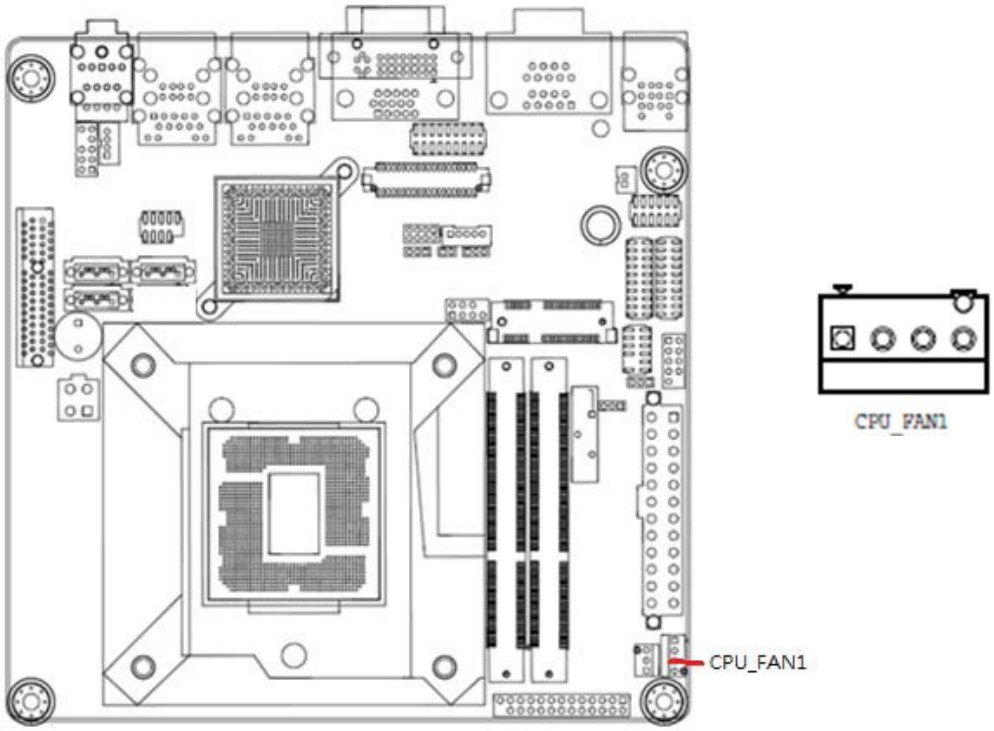
Table 2.4: Serial Port Connectors (COM34, COM56)			
Pin	**Signal**	**Pin**	**Signal**
1	DCD#	2	DSR#
3	RXD	4	RTS#
5	TXD	6	CTS#
7	DTR#	8	RI#
9	GND	10	GND
11	DCD#	12	DSR#
13	RXD	14	RTS#
15	TXD	16	CTS#
17	DTR#	18	RI#
19	GND	20	GND

2.5 PS/2 Keyboard/Mouse Connector



A 6-pin mini-DIN connector located on the motherboard supports connection to a PS/2 keyboard or PS/2 mouse.

2.6 CPU Fan Connector (CPU_FAN1)

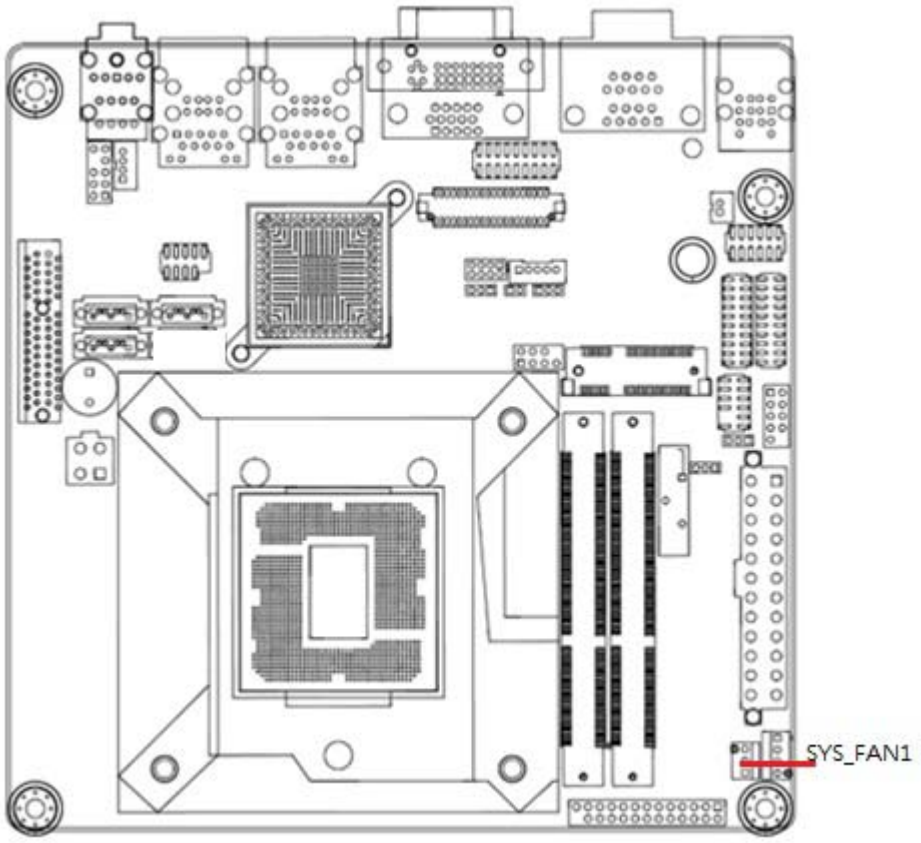


If a fan is used, this connector can support cooling fans of up to 500 mA (6 W).

Table 2.5: CPU Fan Connector (CPU_FAN1)

Pin	Pin Name
1	GND
2	+12 V
3	Tach
4	PWM

2.7 System FAN Connector (SYS_FAN1)



If a fan is used, this connector can support cooling fans of up to 500 mA (6 W).

Table 2.6: System Fan Connector (SYS_FAN1)

Pin	Pin Name
1	GND
2	SYSFAN1_VCC(PWM)
3	SYSFAN1_IO

2.8 System Panel (F_PANEL)

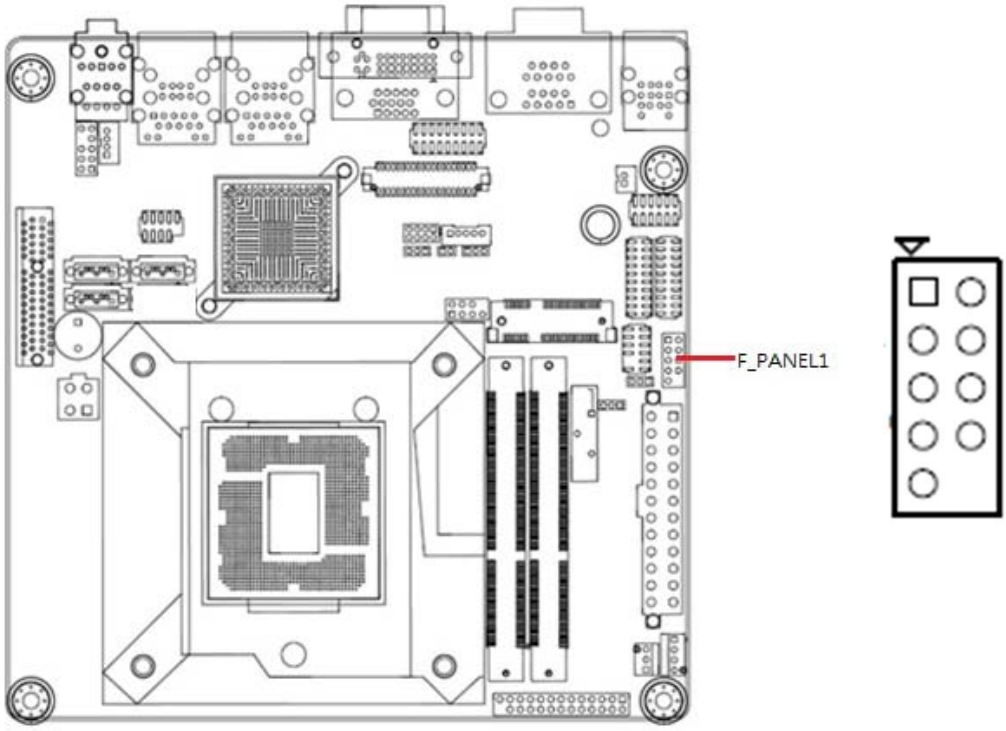
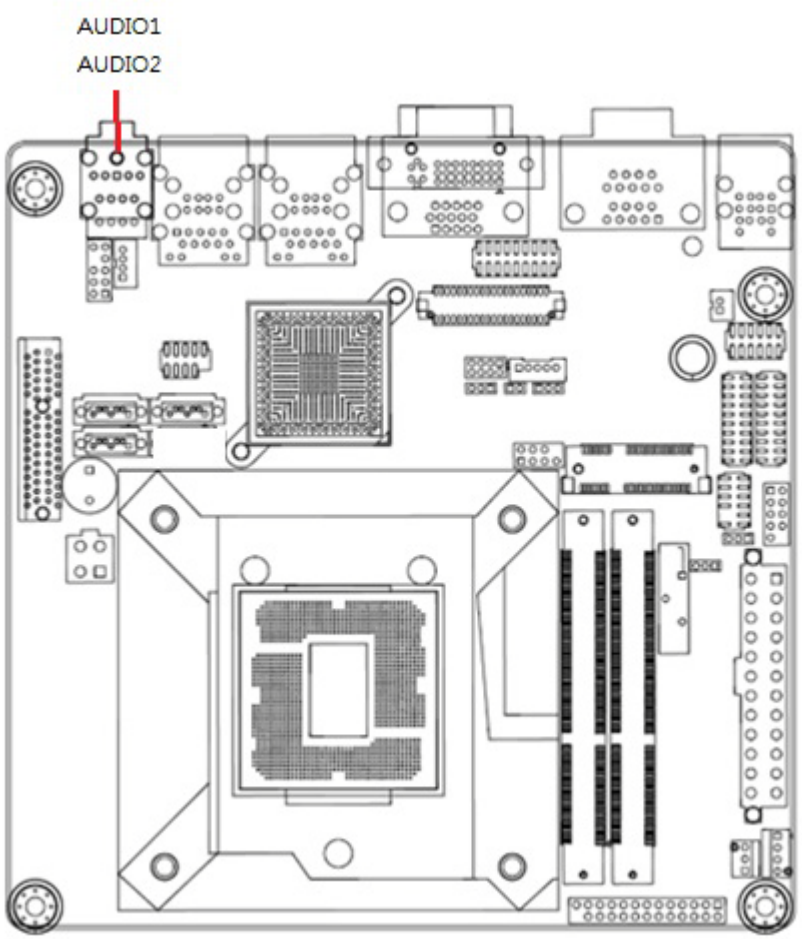


Table 2.7: System Panel (F_PANEL)

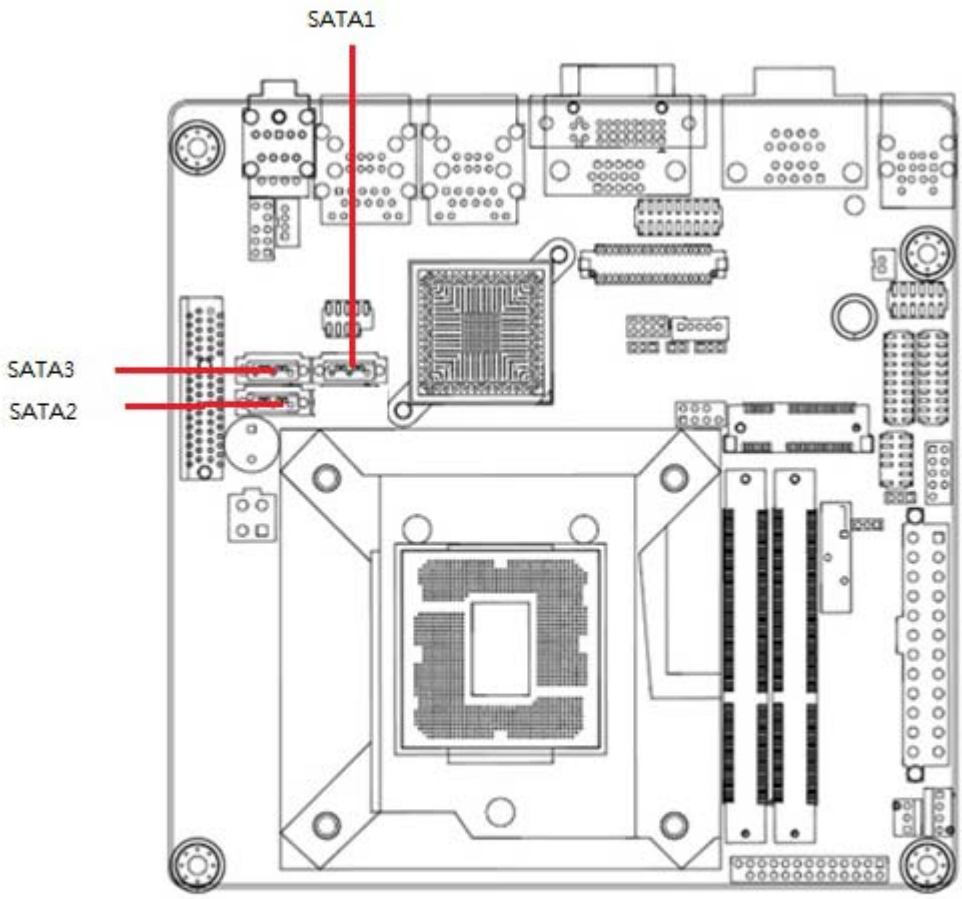
Pin	Signal	Pin	Signal
1	HDDLED+	2	POWERLED+
3	HDDLED-	4	POWERLED-
5	GND	6	PWSWITCH
7	RESET	8	GND
9	NC		

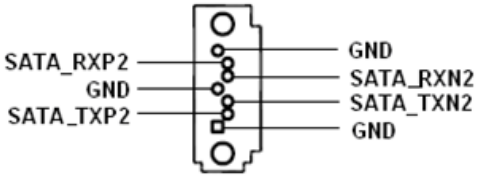
- **ATX Power Button/Soft-Off Button (Pin 6-8 PWRBT)**
  This 2-pin connector is provided for the system power button. Pressing the power button turns the system on or puts the system in sleep or soft-off mode depending on the BIOS settings. Pressing and holding the power button for at least 4 seconds when the system is ON turns the system OFF.
- **Reset Button (Pin 5-7 SYS_RST)**
  This 2-pin connector is provided for the chassis-mounted reset button, which enables system reboots without turning off the system power.
- **Power LED (Pin 2-4 PWRLED)**
  This 2-pin connector is provided for the system power LED. Connect the chassis power LED cable to this connector. The system power LED lights up when the system is powered on and blinks when the system is in sleep mode.
- **Hard Disk Drive Activity LED (Pin 1-3 HDLED)**
  This 2-pin connector is provided for the HDD activity LED. Connect the HDD activity LED cable to this connector. The IDE LED lights up or flashes when data is read from or written to the HDD.

2.9 Line-Out, Mic-In Connector (AUDIO1/AUDIO2)



2.10 Serial ATA Interface (SATA1 ~ SATA3)

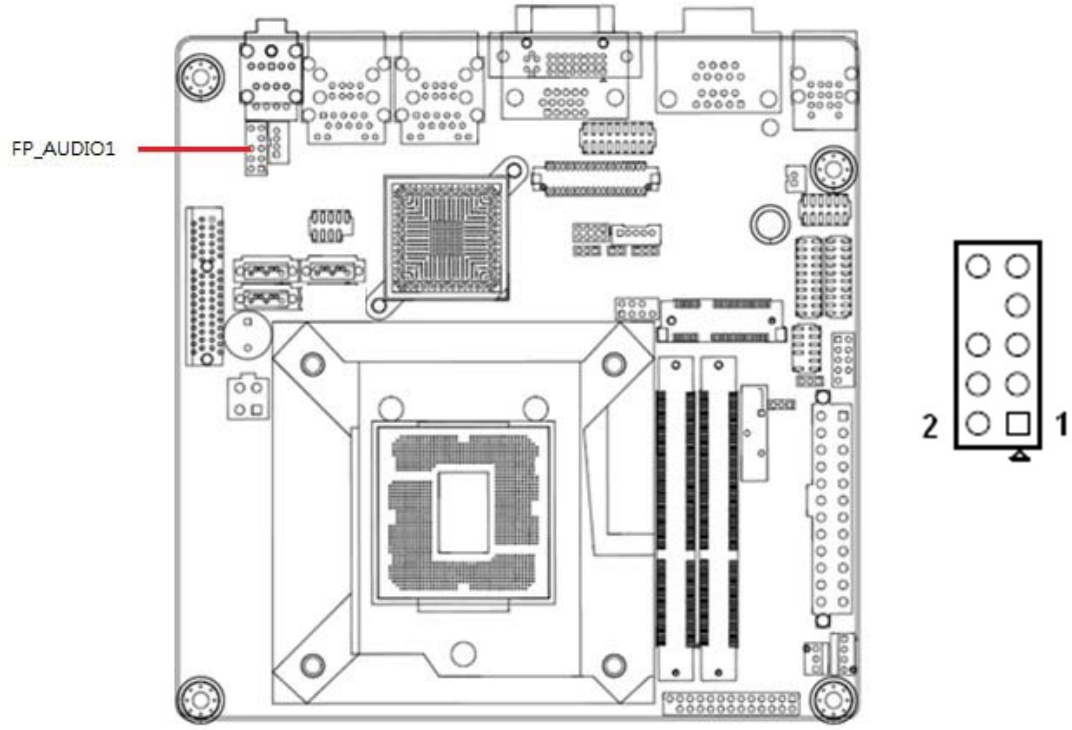




AIMB-281 features a high-performance serial ATA interface (up to 300 MB/s) that reduces hard drive cabling with the use of thin, space-saving cables.

2.11 Front Headphone Connector (FP_AUDIO1)

This connector is provided for a chassis-mounted front panel audio I/O module that supports either HD audio or the legacy AC'97 (optional) audio standard. Connect this connector to the front panel audio I/O module cable.



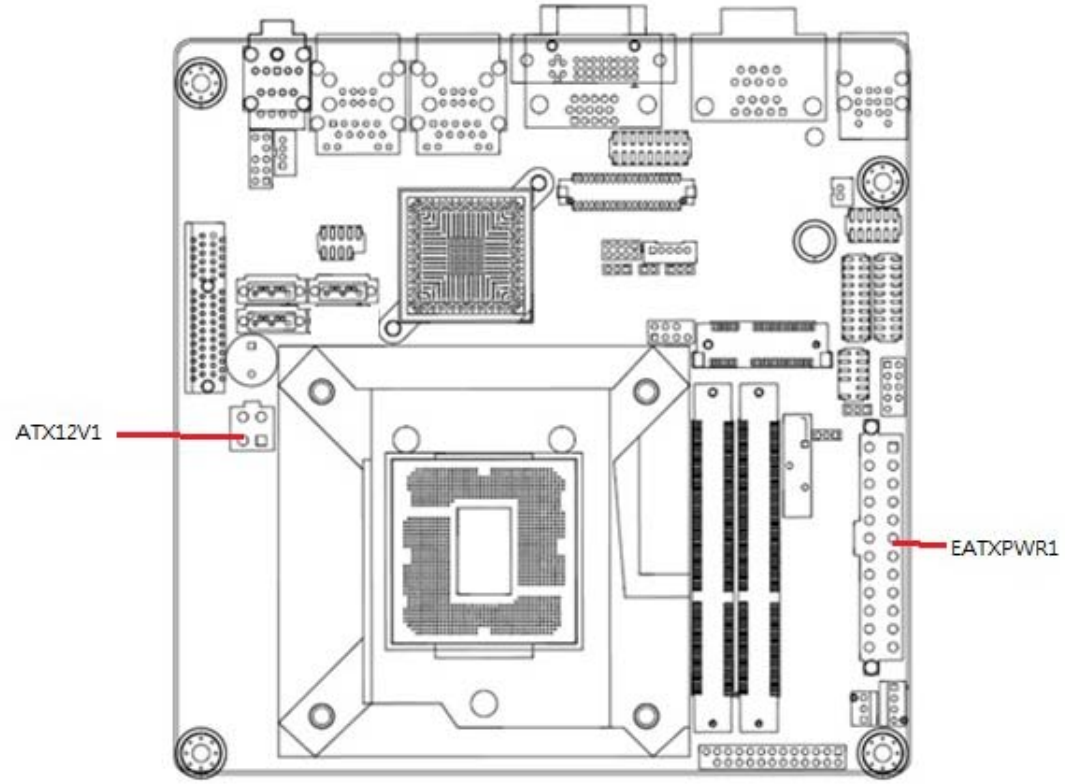
Note! *For motherboards with the optional HD audio feature, we recommend connecting a high-definition front panel audio module to this connector to benefit from the motherboard's high-definition audio capability.*

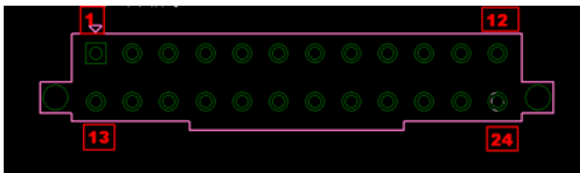
Table 2.8: Front Headphone Connector (FP_AUDIO1)

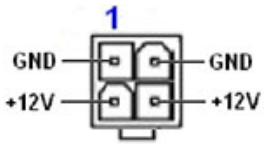
Pin	Signal	Pin	Signal
1	MIC2_L	2	GND
3	MIC2_R	4	PRESENSE
5	LIN2_R	6	MIC2_JD
7	FIO_SENSE	8	NC
9	LIN2_L	10	LINE_JD

2.12 ATX Power Connector (EATXPWR1, ATX12V1)

This connector is provided for an ATX micro-fit power supply. The power supply plugs are designed to fit these connectors in only one direction. After determining the correct orientation, push down firmly until the connectors mate completely.







Note!

1. Connect the ATX12V1 connector with the PSU ATX 12V 4-pin connector.
2. For a fully configured system, we recommend using a power supply unit (PSU) that complies with the ATX 12 V Specification 2.0 (or later versions) and provides a minimum power of 180 W.

Table 2.9: ATX Power Connector (EATXPWR1, ATX12V1)

Pin	Signal	Pin	Signal
1	+3.3 V	2	+3.3 V
3	Ground	4	+5 V
5	Ground	6	+5 V
7	Ground	8	PWRGD (Power Good)
9	+5 V (Standby)	10	+12 V
11	+12 V	12	+3.3 V
13	+3.3 V	14	-12 V

Table 2.9: ATX Power Connector (EATXPWR1, ATX12V1)			
15	Ground	16	PS-ON# (power supply remote on/off)
17	Ground	18	Ground
19	Ground	20	No connect
21	+5V	22	+5V
23	+5V	24	Ground

2.13 SPI Flash Connector (JSPI)

This is a point-to-point interface standard that allows network equipment designers to develop an array of next-generation multi-service switches and routers for supporting multi-service traffic with aggregate bandwidths of up to OC-192 (10 Gb/s). Thus, this standard facilitates dramatic increases in system performance.

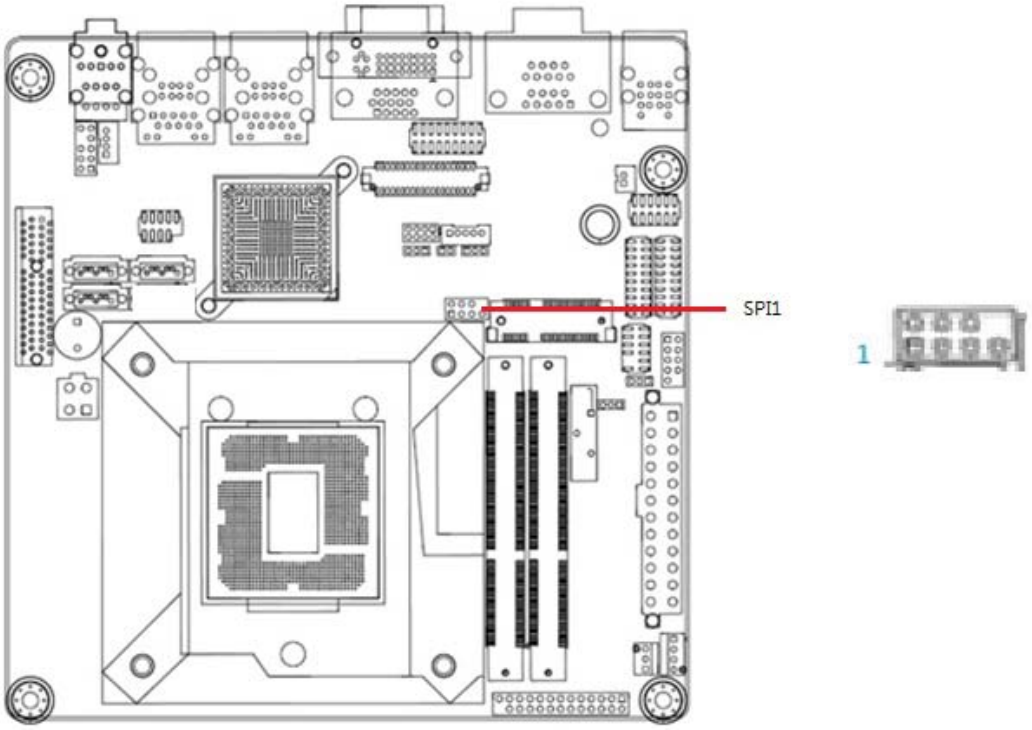


Table 2.10: SPI Flash Connector (SPI1)			
Pin	**Signal**	**Pin**	**Signal**
1	+3 V	2	GND
3	SP1_CS#	4	SPI_CLK
5	SPI_MISO	6	SPI_MOSI
7	SPI_HOLD#		

2.14 LCD Inverter Connector (JBKL1)

This connector is provided for controlling the internal LVDS brightness.

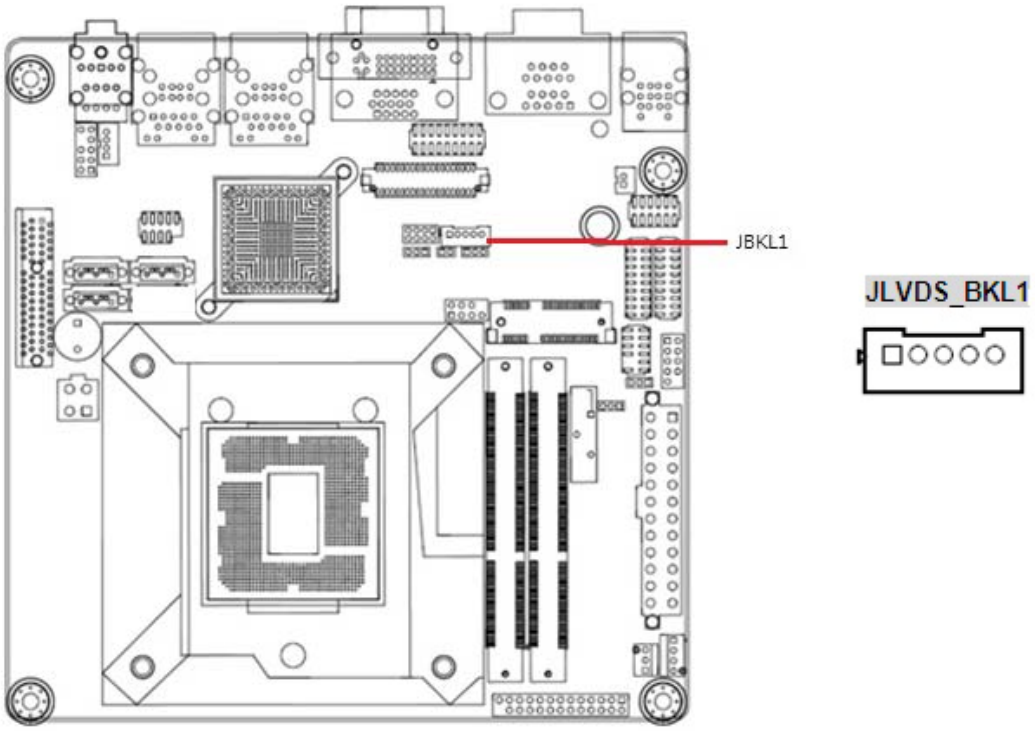


Table 2.11: LCD Inverter Connector (JBKL1)

Pin	Signal
1	+12 V
2	GND
3	BL_EN
4	BRIGHT1
5	+5 V

2.15 LVDS Connector (JLVDS1)

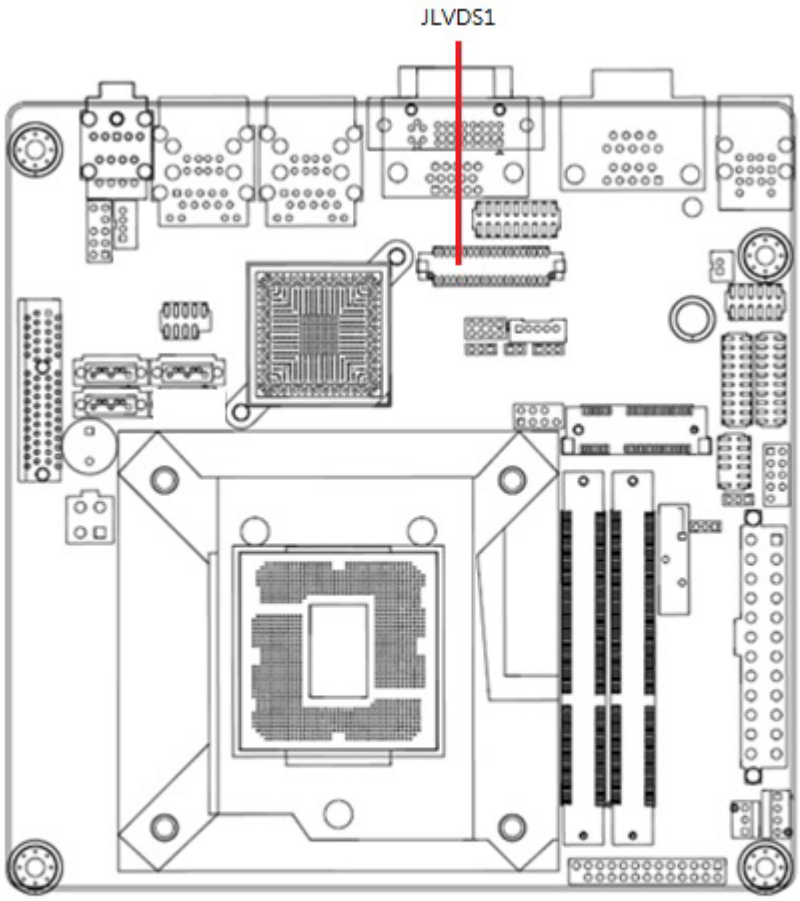


Table 2.12: LVDS Connector (JLVDS1)

Pin	Signal	Pin	Signal
1	VDD(+3.3 V)	2	VDD(+5 V)
3	VDD(+3.3 V)	4	VDD(+5 V)
5	I2C_CLK	6	I2C_DATA
7	GND	8	GND
9	LVDS_A1+	10	LVDS_A0+
11	LVDS_A1-	12	LVDS_A0-
13	GND	14	GND
15	LVDS_A3+	16	LVDS_A2+
17	LVDS_A3-	18	LVDS_A2-
19	GND	20	GND
21	LVDS_B1+	22	LVDS_B0+
23	LVDS_B1-	24	LVDS_B0-
25	GND	26	GND
27	LVDS_B3+	28	LVDS_B2+

Table 2.12: LVDS Connector (JLVDS1)			
29	LVDS_B3-	30	LVDS_B2-
31	GND	32	GND
33	LVDS_B_CK+	34	LVDS_A_CK+
35	LVDS_B_CK-	36	LVDS_A_CK-
37	GND	38	GND
39	VDD(+12 V)	40	VDD(+12 V)

2.16 General Purpose I/O Connector (JDIO1)

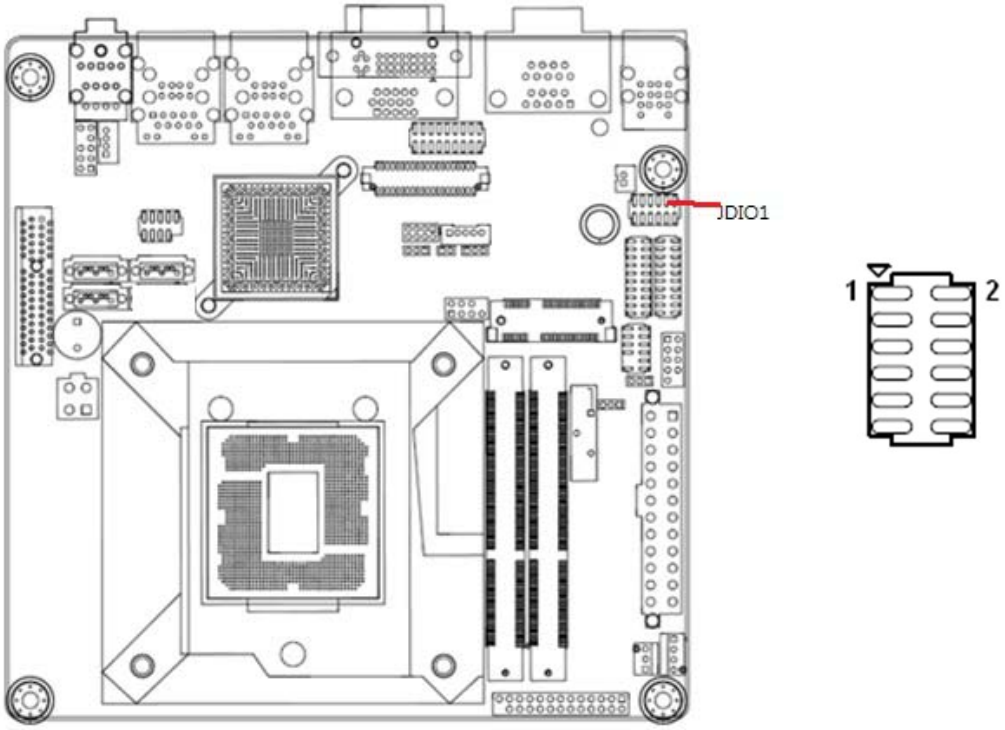


Table 2.13: General Purpose I/O Connector (JDIO1)			
Pin	**Signal**	**Pin**	**Signal**
1	SIO_SPIO0	2	SIO_SPIO4
3	SIO_SPIO1	4	SIO_SPIO5
5	SIO_SPIO2	6	SIO_SPIO6
7	SIO_SPIO3	8	SIO_SPIO7
9	SMB_CLK_MAIN	10	SMB_DAT_MAIN
11	GND	12	SVCC GPIO

2.17 LPC Connector for Debug (JLPC1)

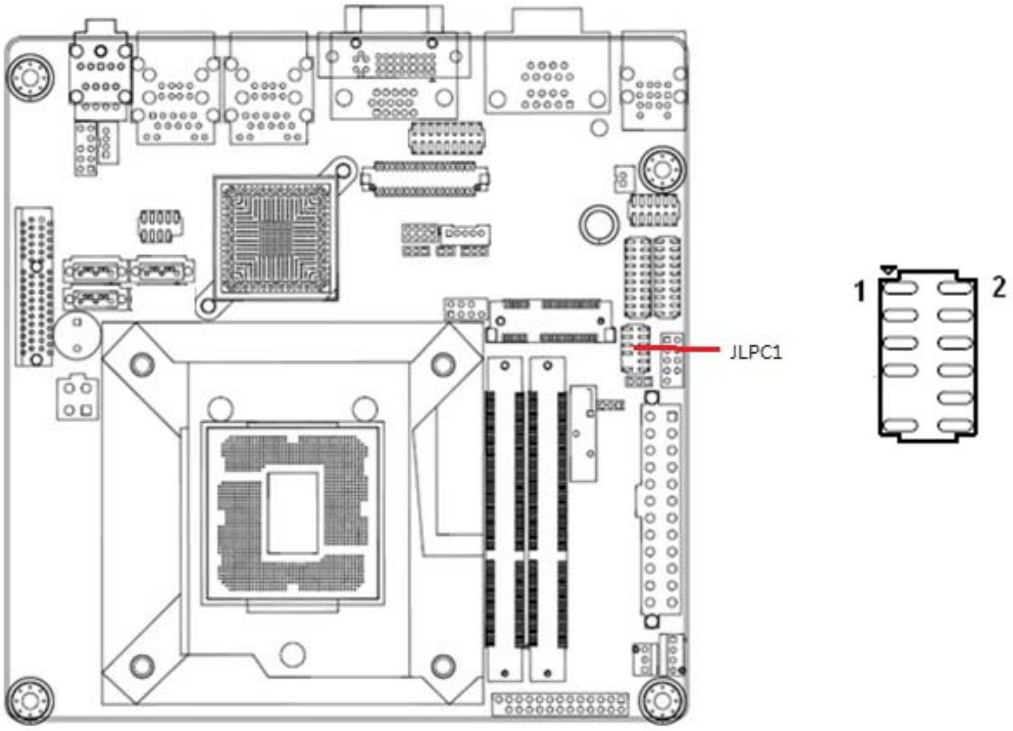


Table 2.14: General Purpose I/O Connector (JDIO1)

Pin	Signal	Pin	Signal
1	NC	2	+3.3
3	LPC_AD3	4	PRST_SIO#
5	LPC_AD1	6	LPC_AD2
7	LPC_FRAME#	8	LPC_AD0
9	CLK33M_LPC	10	GND
11	CLK33M_LPC	12	GND

2.18 JSETCOM1

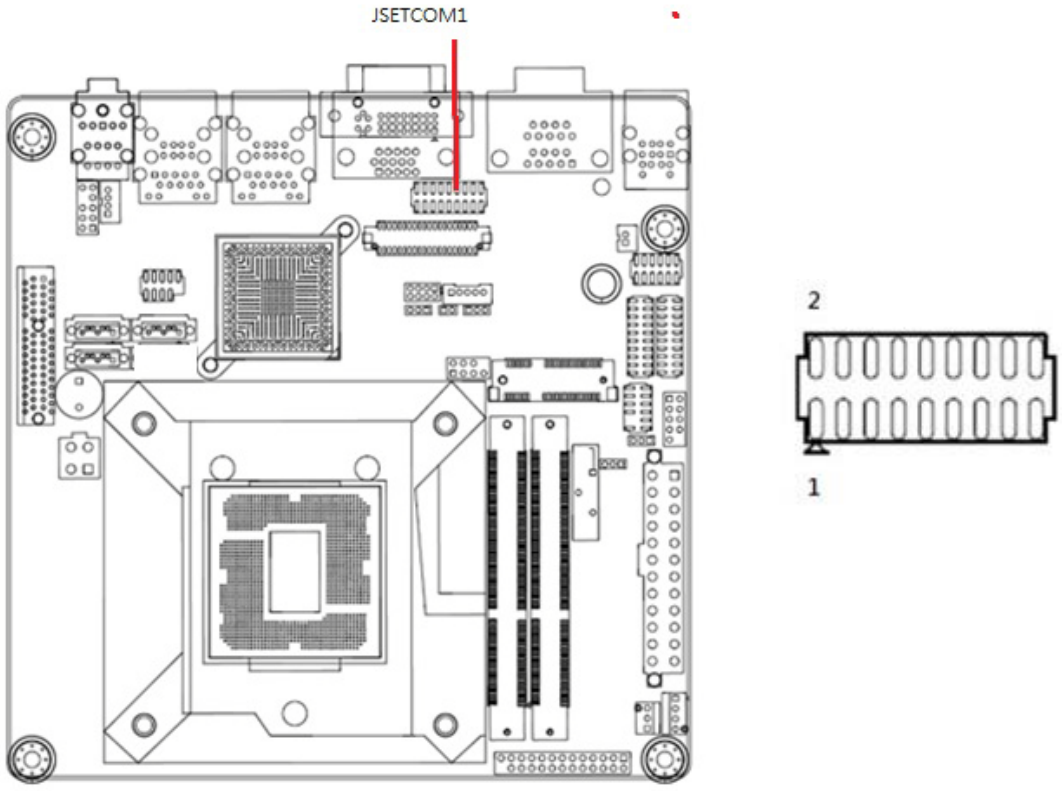


Table 2.15: JSETCOM1

Pin	Signal	Pin	Signal
1	UART1_RXD	2	COM1_485_RXD
3	UART1_RXD	4	COM1_422_RXD
5	UART1_RXD	6	COM1_232_RXD
7	COM1_BUF_DCD#	8	COM1_BUF_TXD
9	COM1_DCD#	10	COM1_TXD
11	COM1_TXD422-	12	COM1_RXD422+
13	COM1_BUF_RXD	14	COM1_BUF_DTR#
15	COM1_RXD	16	COM1_DTR#
17	COM1_TXD422+	18	COM1_RXD422-

2.19 LPT1

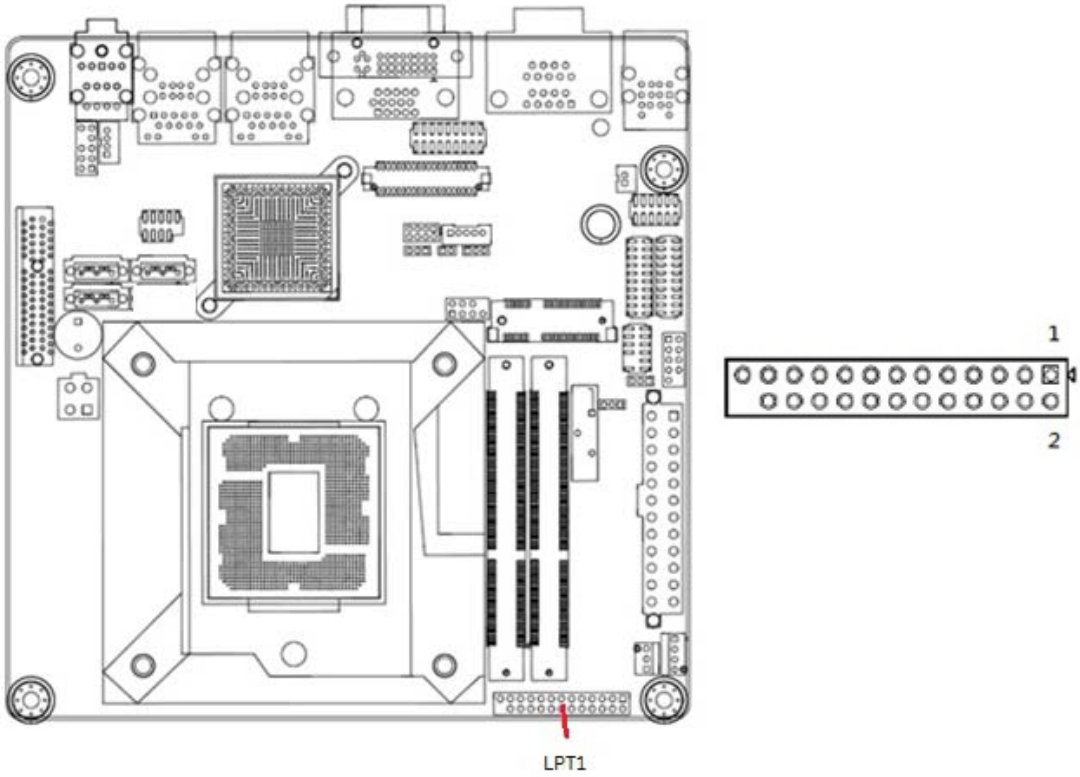


Table 2.16: LPT1

Pin	Signal	Pin	Signal
1	STB#	2	AFD#
3	DATA0	4	ERR#
5	DATA1	6	.INIT#
7	DATA2	8	SLIN#
9	DATA3	10	GND
11	DATA4	12	GND
13	DATA5	14	GND
15	DATA6	16	GND
17	DATA7	18	GND
19	ACK#	20	GND
21	BUSY	22	GND
23	PE	24	GND
25	SLCT	26	NC

Chapter 3

BIOS Operation

3.1 Introduction

AMI BIOS is extremely popular and has been integrated into numerous motherboards for over a decade. The AMI BIOS setup menu is also referred to as BIOS, BIOS setup, or CMOS setup.

With the AMI BIOS setup program, users can modify BIOS settings to control the special computer features. The setup program comprises several menus and configurable options. The basic navigation of the AIMB-281 setup screens is described in this chapter.

3.2 BIOS Setup

The AIMB-281 system is equipped with AMI BIOS as well as a CMOS setup utility that allows users to configure settings and activate certain system features.

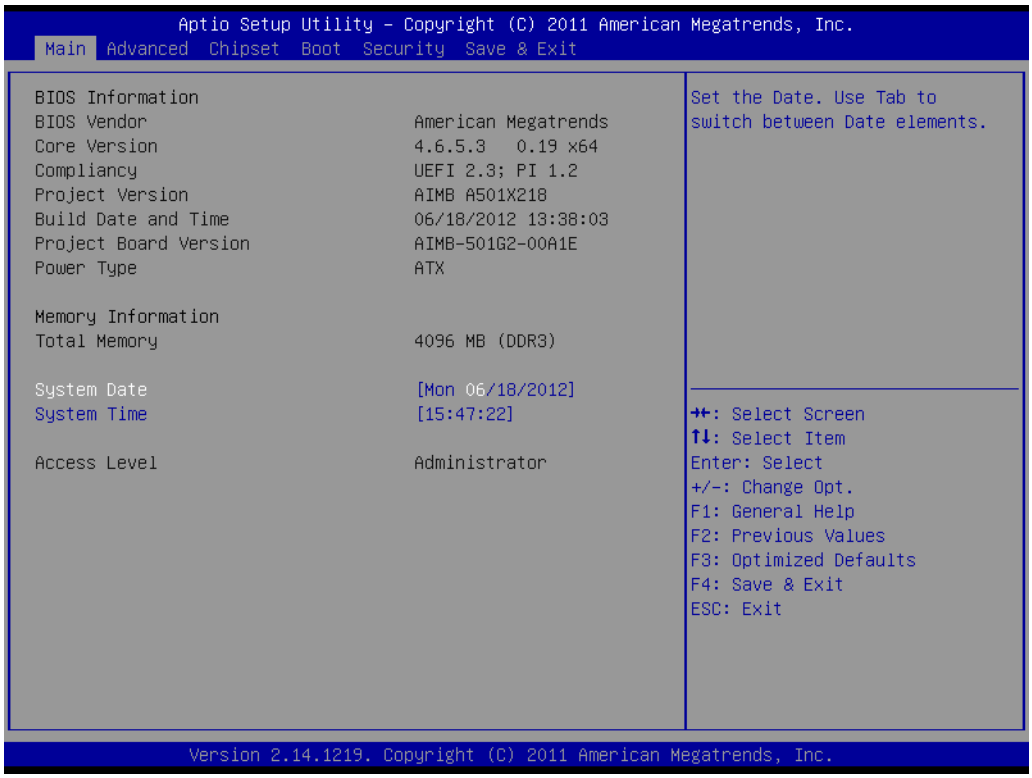
The CMOS setup utility saves all configuration settings to the CMOS RAM of the motherboard. When the power is turned off, the battery on the board provides the necessary power to preserve the CMOS RAM.

When the power is turned on, users can access the CMOS setup screen by pressing the <Del> button during the BIOS POST (Power-On Self Test).

Control Keys	
< ↑ >< ↓ >< ← >< → >	Move to specific item
<Enter>	Select item
<Esc>	Main Menu - Quit without saving changes into CMOS Sub Menu - Exit current page and return to the Main Menu
<Page Up/+>	Increase the numeric value or make changes
<Page Down/->	Decrease the numeric value or make changes
<F1>	General help, access the Setup Sub Menu
<F2>	Item help
<F5>	Load previous values
<F7>	Load setup defaults
<F10>	Save all CMOS changes

3.3 Main BIOS Setup

Press <Del> to access the AMI BIOS CMOS setup utility. Upon entering, the Main Menu page will appear on screen. Use the arrow keys to scroll through the items and then press <Enter> to accept the setting or enter the sub-menu.


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
BIOS Information
BIOS Vendor American Megatrends
Core Version 4.6.5.3 0.19 x64
Compliancy UEFI 2.3; PI 1.2
Project Version AIMB A501X218
Build Date and Time 06/18/2012 13:38:03
Project Board Version AIMB-501G2-00A1E
Power Type ATX
Memory Information
Total Memory 4096 MB (DDR3)
System Date [Mon 06/18/2012]
System Time [15:47:22]
Access Level Administrator
Set the Date. Use Tab to switch between Date elements.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

The Main BIOS setup screen features two main frames. The left frame displays all configurable items. The grayed-out items cannot be configured; only the items in blue can. The key legend is displayed in the right frame.

Above the key legend is an area reserved for a text message. When an item is selected in the left frame, the color of the text becomes white. Often an accompanying text message will be displayed in the upper right frame.

- **System Time/System Date**

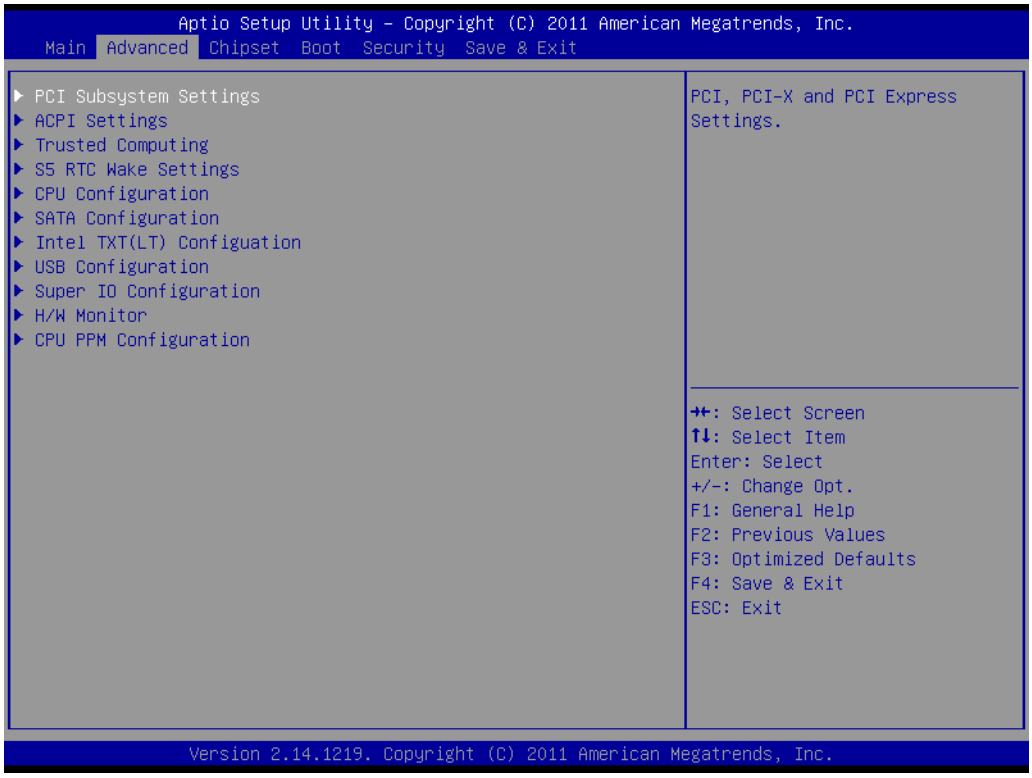
  Use this option to change the system time and date. Highlight System Time or System Date using the <Arrow> keys. Enter new values via a keyboard. Press the <Tab> key or <Arrow> keys to move between fields. The date must be entered in MM/DD/YY format. The time must be entered in HH:MM:SS format.

3.3.1 Advanced BIOS Features

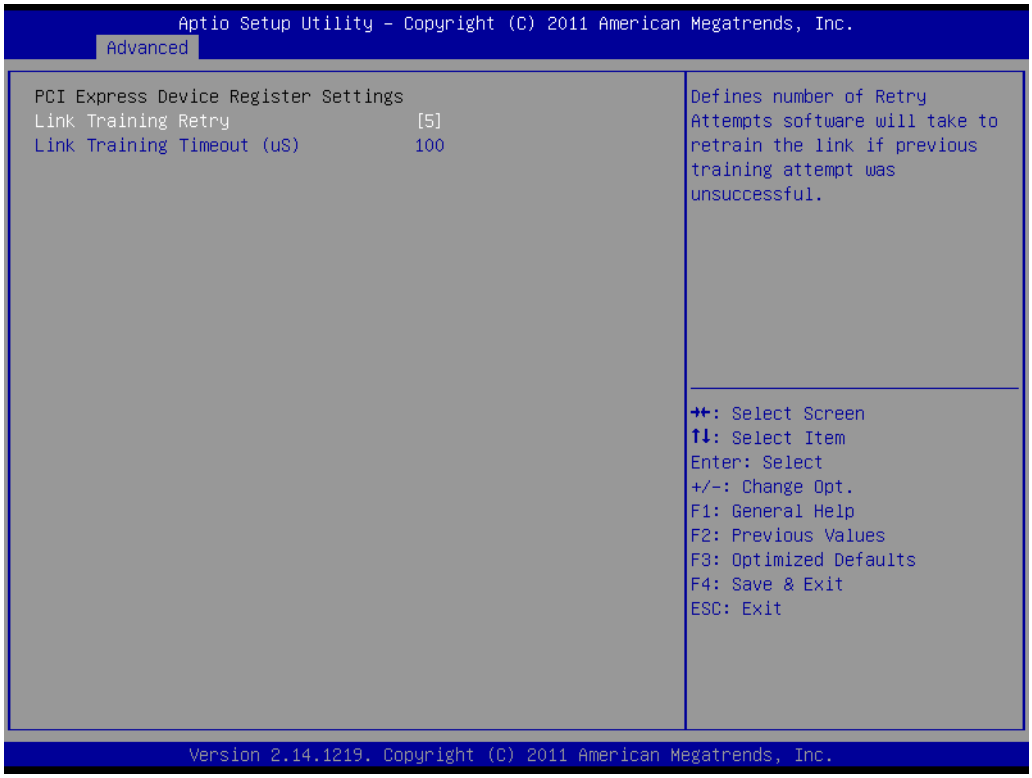
Select the Advanced tab from the AIMB-281 setup screen to enter the Advanced BIOS setup screen. Users can select any item listed in the left frame, for example, CPU Configuration, to access the sub-menu for that item. Advanced BIOS setup options can be displayed for review by using the <Arrow> keys to select the item.

The Advanced BIOS Setup screen is shown below.

All Advanced BIOS Setup options are described in this section. The sub-menu items are also described in the following pages.

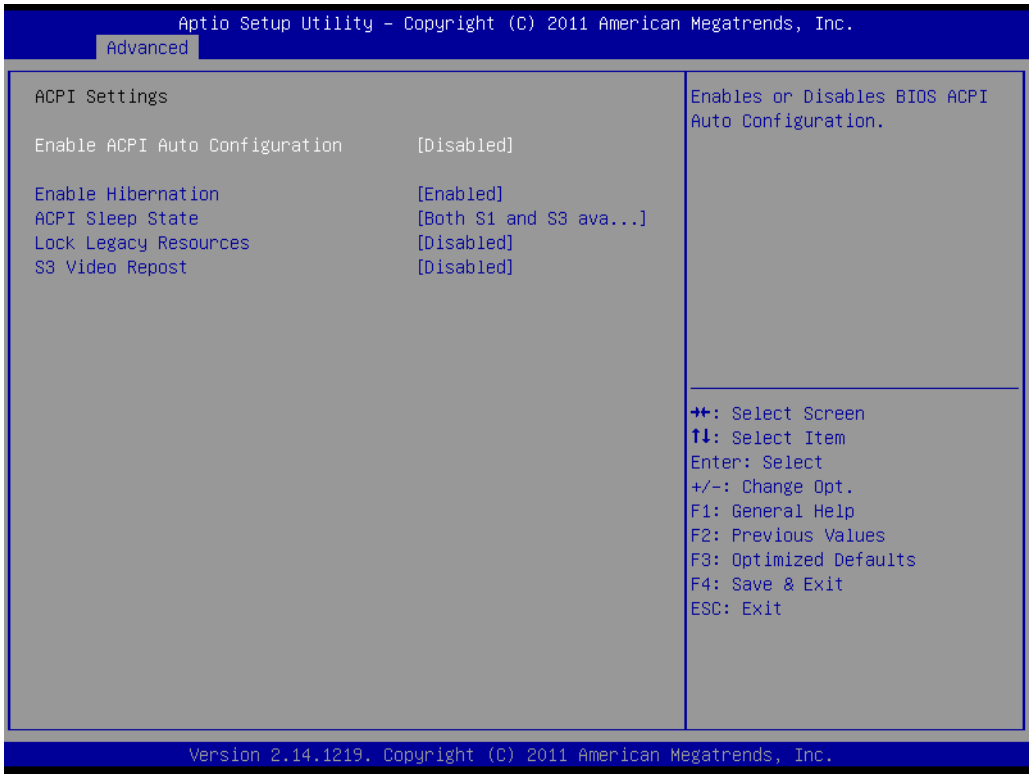


3.3.2 PCI Express Settings


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
PCI Express Device Register Settings
Link Training Retry [5]
Link Training Timeout (uS) 100
Defines number of Retry Attempts software will take to retrain the link if previous training attempt was unsuccessful.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

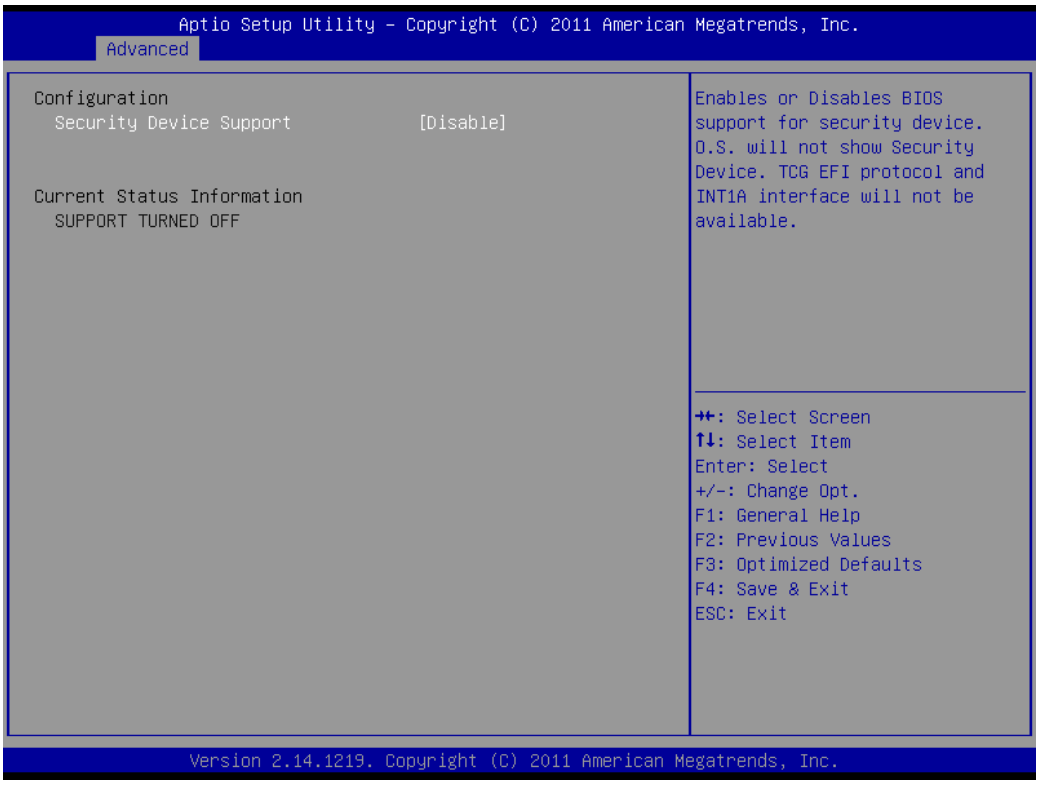
- **Link Training Retry**
  This item allows users to adjust the number of retries for PCIE link failures.
- **Link Training Timeout**
  This item allows users to setup a timeout for link training.

3.3.3 ACPI Settings


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
ACPI Settings
Enable ACPI Auto Configuration [Disabled]
Enable Hibernation [Enabled]
ACPI Sleep State [Both S1 and S3 ava...]
Lock Legacy Resources [Disabled]
S3 Video Repost [Disabled]
Enables or Disables BIOS ACPI Auto Configuration.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

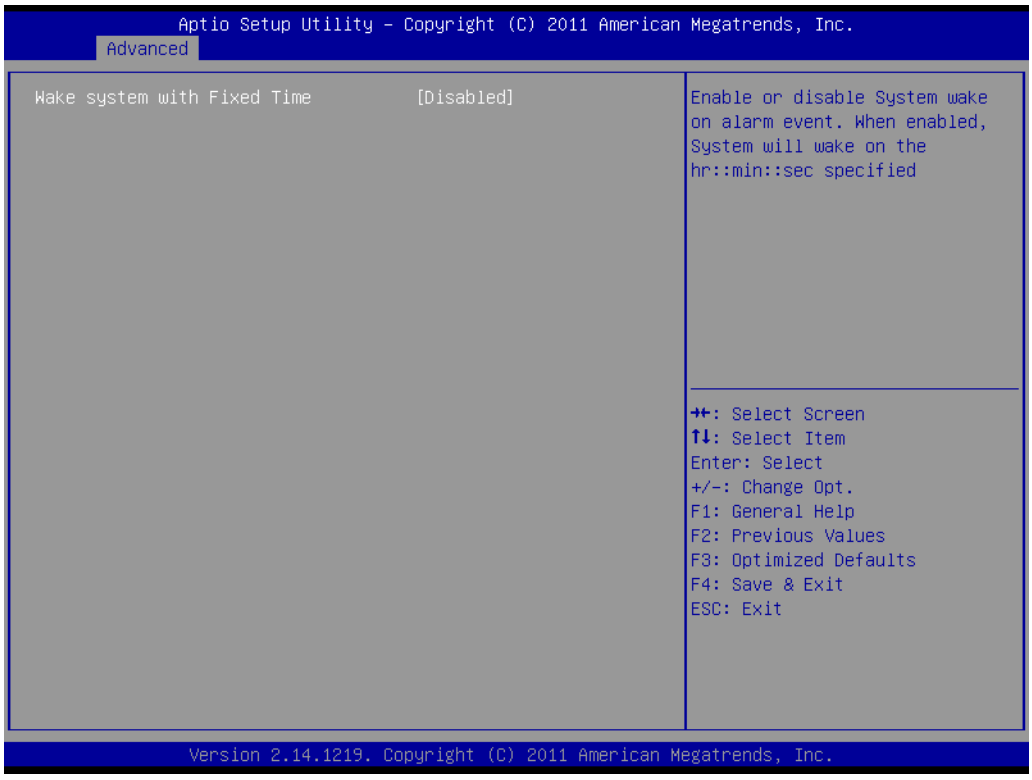
- **Enable ACPI Auto Configuration**
  This item allows users to enable or disable BIOS ACPI auto configuration.
- **Enable Hibernation**
  This item allows users to enable or disable hibernation.
- **ACPI Sleep State**
  This item allows users to set the ACPI sleep state.
- **Lock Legacy Resources**
  This item allows users to lock legacy device resources.
- **S3 Video Repost**
  This item allows users to enable or disable S3 video reposting.

3.3.4 Trusted Computing


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
Configuration
Security Device Support [Disable]
Current Status Information
SUPPORT TURNED OFF
Enables or Disables BIOS support for security device. O.S. will not show Security Device. TCG EFI protocol and INT1A interface will not be available.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

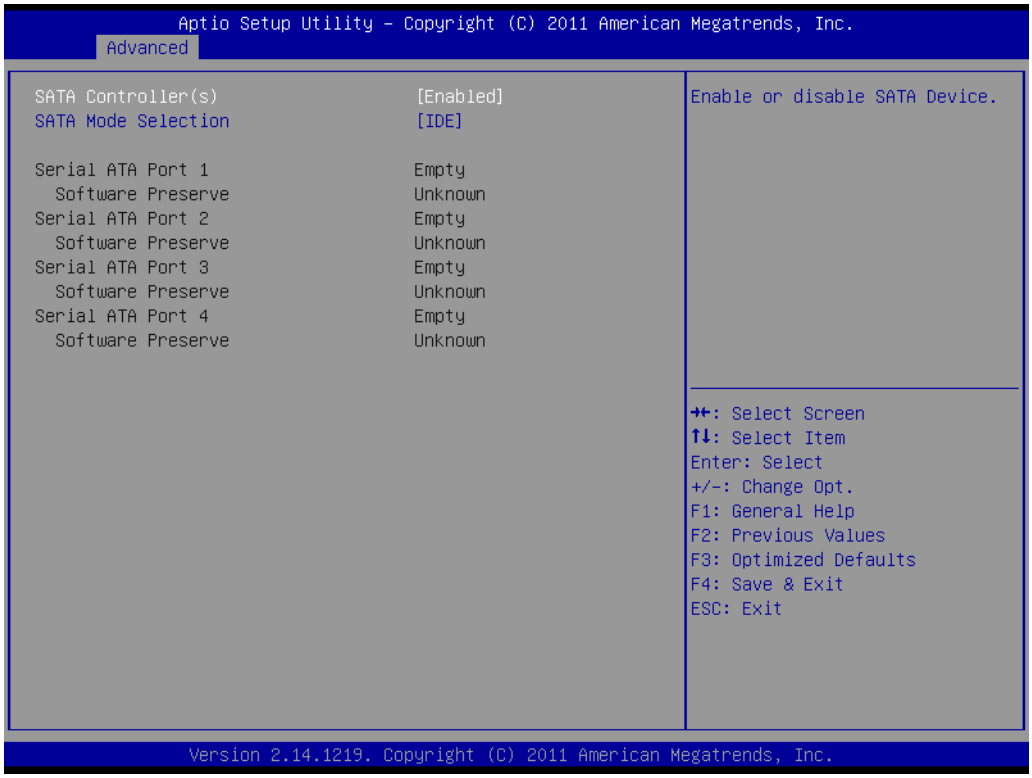
- **Security Device Support**
  This item allows users to enable or disable BIOS support for security devices.

3.3.5 S5 RTC Wake Settings


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
Wake system with Fixed Time [Disabled]
Enable or disable System wake on alarm event. When enabled, System will wake on the hr::min::sec specified
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

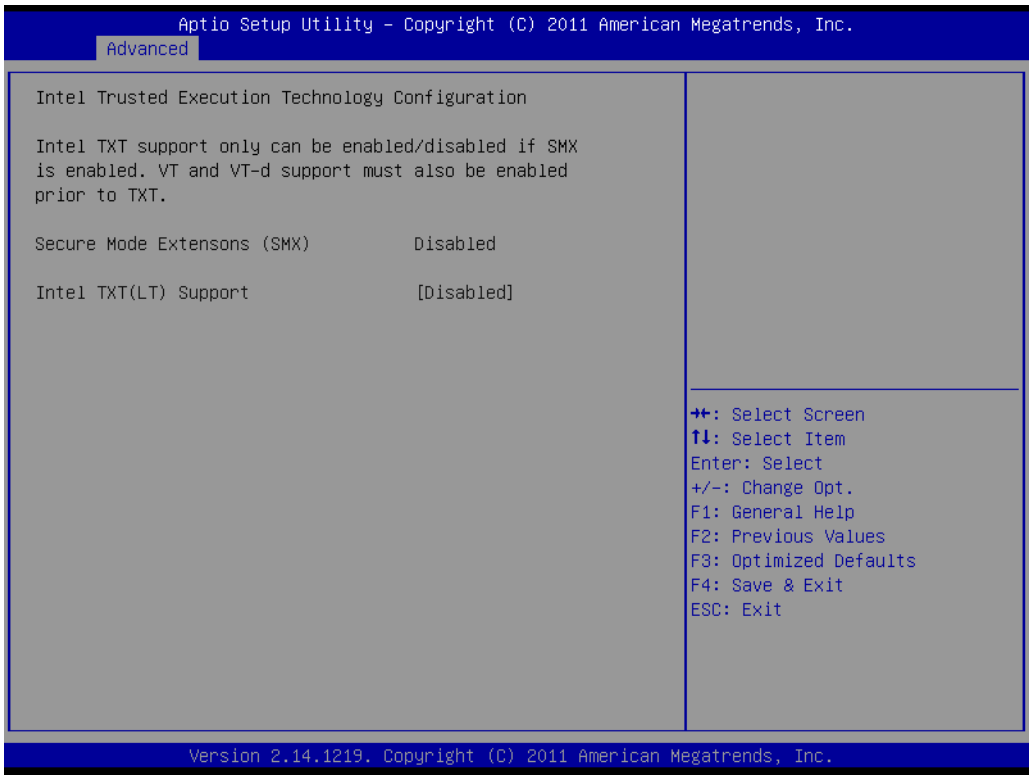
- **Wake System at a Fixed Time**
  This item allows users to enable or disable system wake-on-alarm events.

3.3.6 SATA Configuration



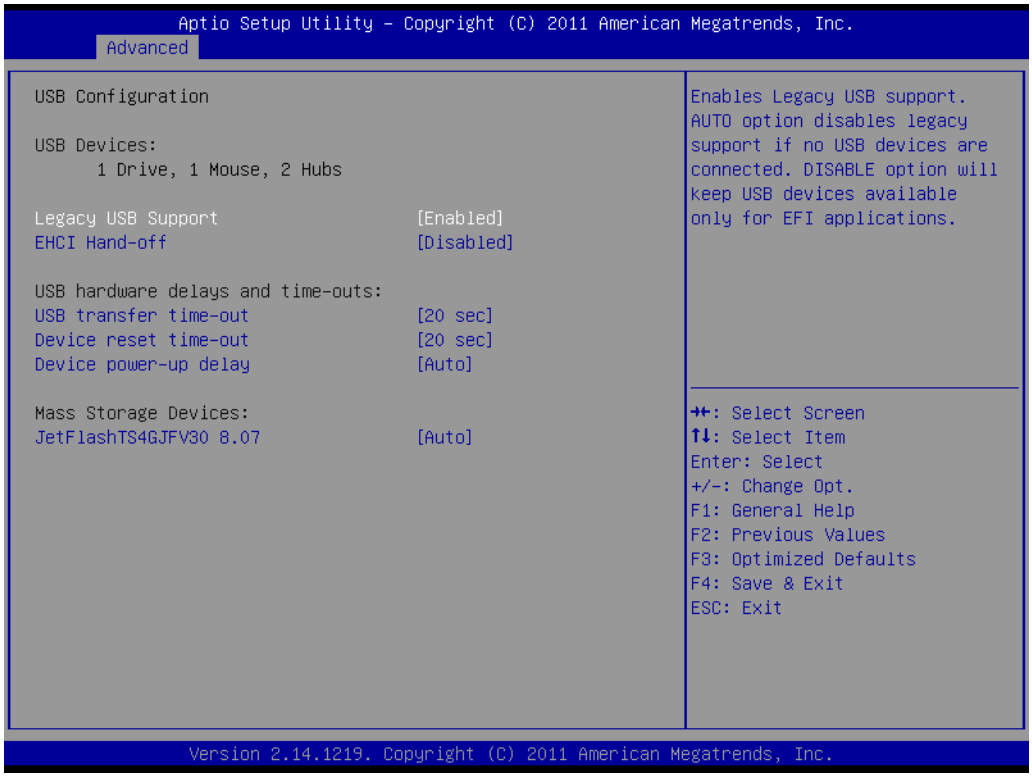
- **SATA Controllers**
  This item allows users to enable or disable SATA controllers.
- **SATA Mode Selection**
  This item allows users to select between IDE or AHCI mode.

3.3.7 Intel Trusted Execution Technology Configuration


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
Intel Trusted Execution Technology Configuration
Intel TXT support only can be enabled/disabled if SMX is enabled. VT and VT-d support must also be enabled prior to TXT.
Secure Mode Extensons (SMX) Disabled
Intel TXT(LT) Support [Disabled]
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

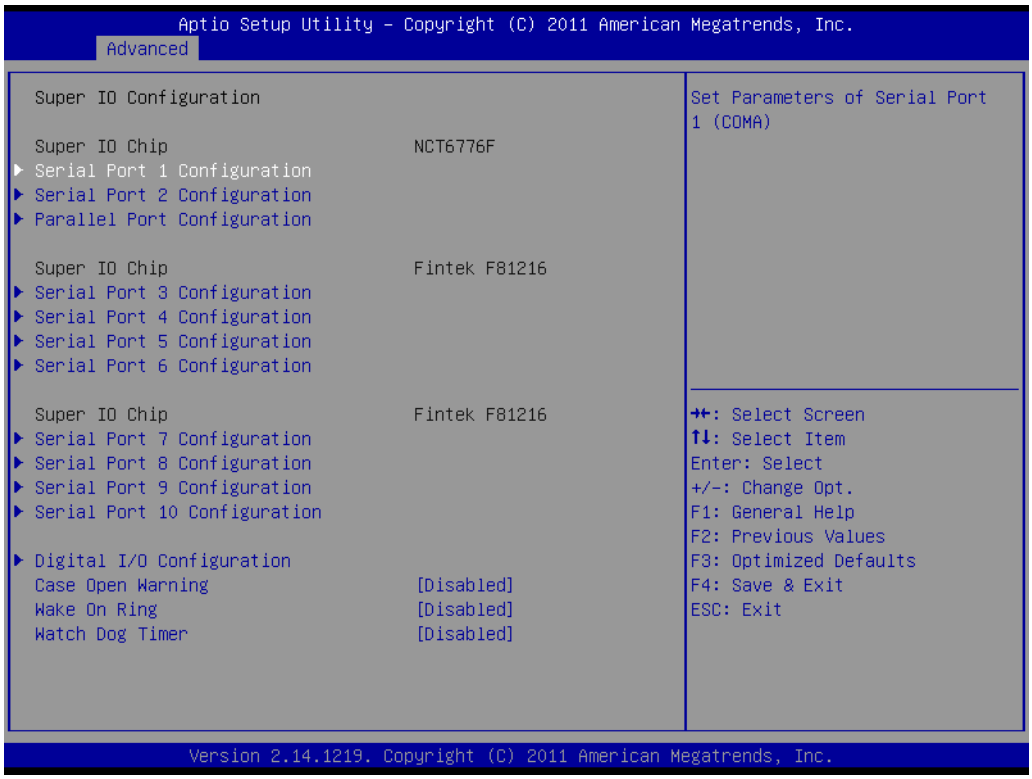
- **Secure Mode Extension (SMX)**
  This item allows users to enable or disable SMX.
- **Intel TXT Configuration**
  This item allow users to enable or disable Intel Trusted Execution Technology.

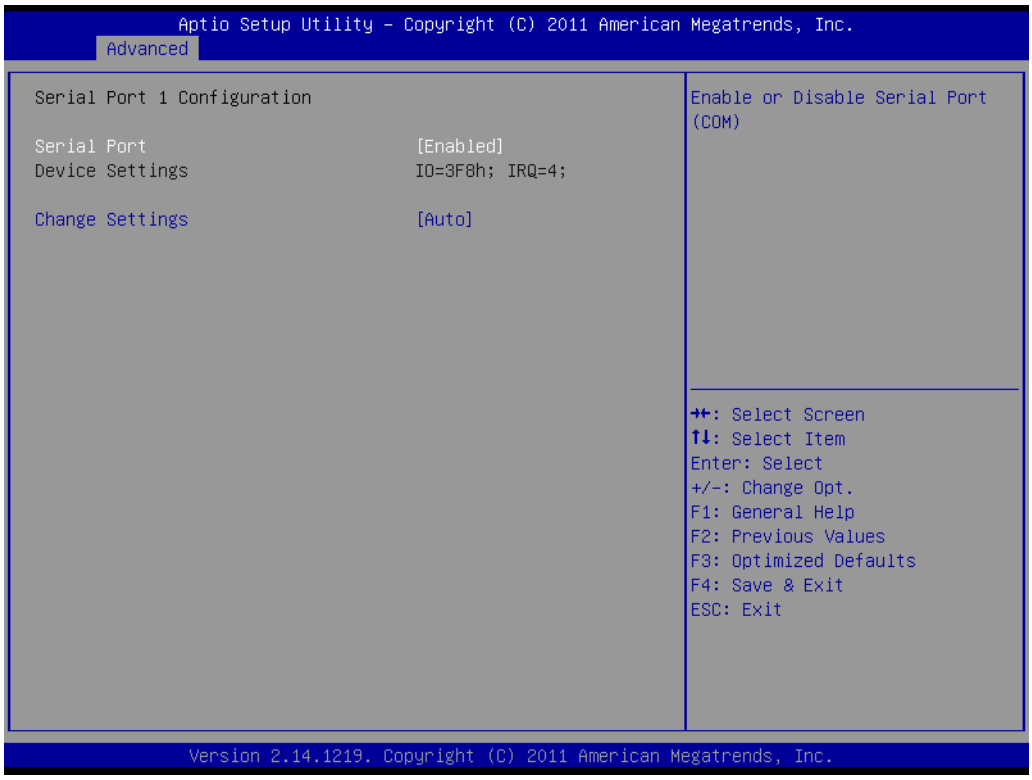
3.3.8 USB Configuration


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
USB Configuration
USB Devices:
1 Drive, 1 Mouse, 2 Hubs
Legacy USB Support [Enabled]
EHCI Hand-off [Disabled]
USB hardware delays and time-outs:
USB transfer time-out [20 sec]
Device reset time-out [20 sec]
Device power-up delay [Auto]
Mass Storage Devices:
JetFlashTS4GJFV30 8.07 [Auto]
Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will keep USB devices available only for EFI applications.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

- **Legacy USB Support**
  This item allows users to enable or disable support for legacy USB. The “Auto” option disables legacy support if no USB devices are connected.
- **EHCI Hand-Off**
  This item is a workaround solution for OS without EHCI hand-off support.
- **USB Hardware Delays and Timeouts**
  This item allows users to setup parameters for detect USB devices.
- **Mass Storage Devices**
  This item allows users to review USB mass storage device information.

3.3.9 Super I/O Configuration


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Advanced
Super IO Configuration
Super IO Chip NCT6776F
Serial Port 1 Configuration
Serial Port 2 Configuration
Parallel Port Configuration
Super IO Chip Fintek F81216
Serial Port 3 Configuration
Serial Port 4 Configuration
Serial Port 5 Configuration
Serial Port 6 Configuration
Super IO Chip Fintek F81216
Serial Port 7 Configuration
Serial Port 8 Configuration
Serial Port 9 Configuration
Serial Port 10 Configuration
Digital I/O Configuration
Case Open Warning [Disabled]
Wake On Ring [Disabled]
Watch Dog Timer [Disabled]
Set Parameters of Serial Port 1 (COMA)
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.



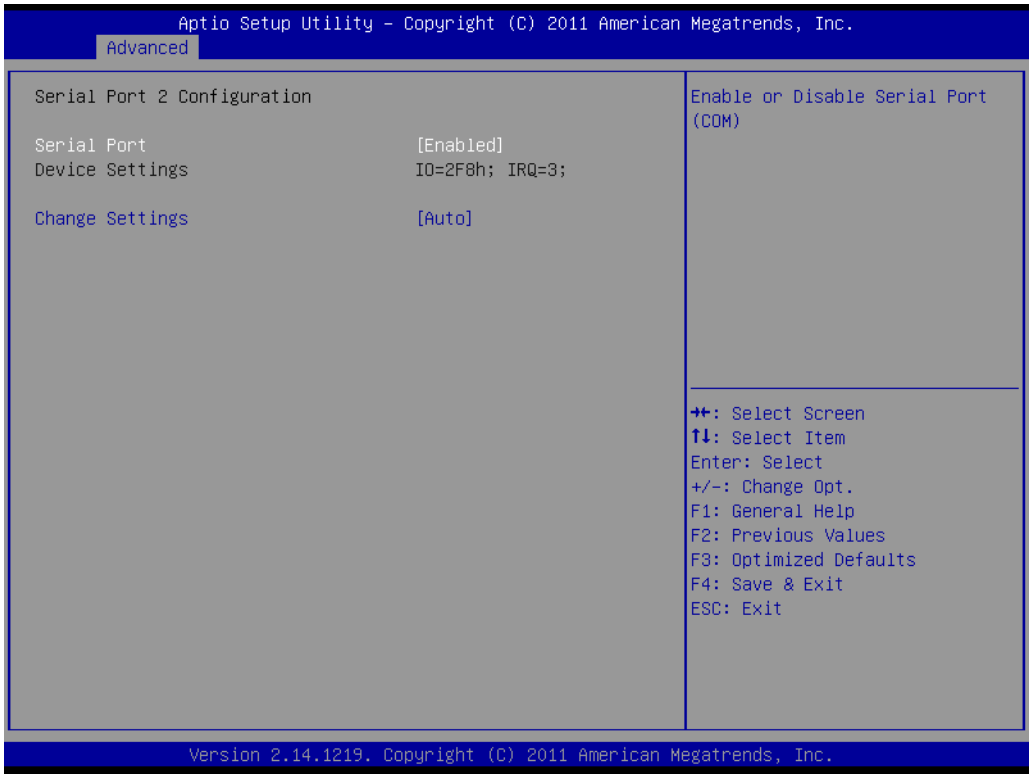
Serial Port 1 Configuration

- **Serial Port**

  This item allows users to enable or disable Serial Port 1.

- **Change Settings**

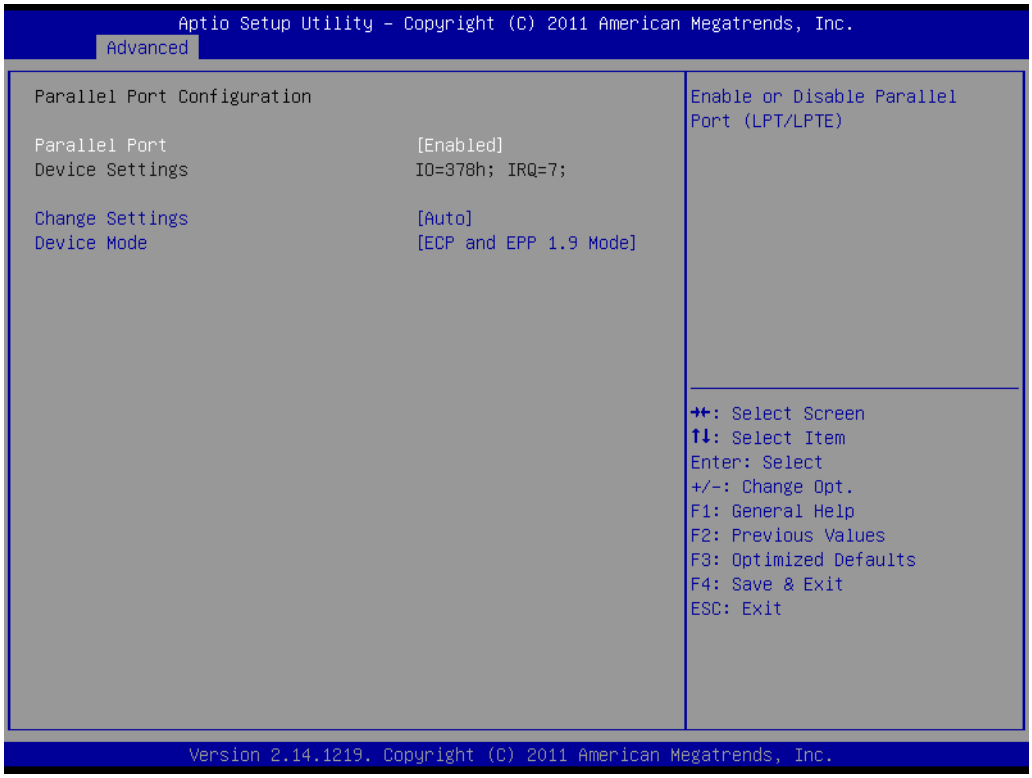
  This item allows users to select the I/O address/IRQ setting for Serial Port 1.



Serial Port 2 Configuration

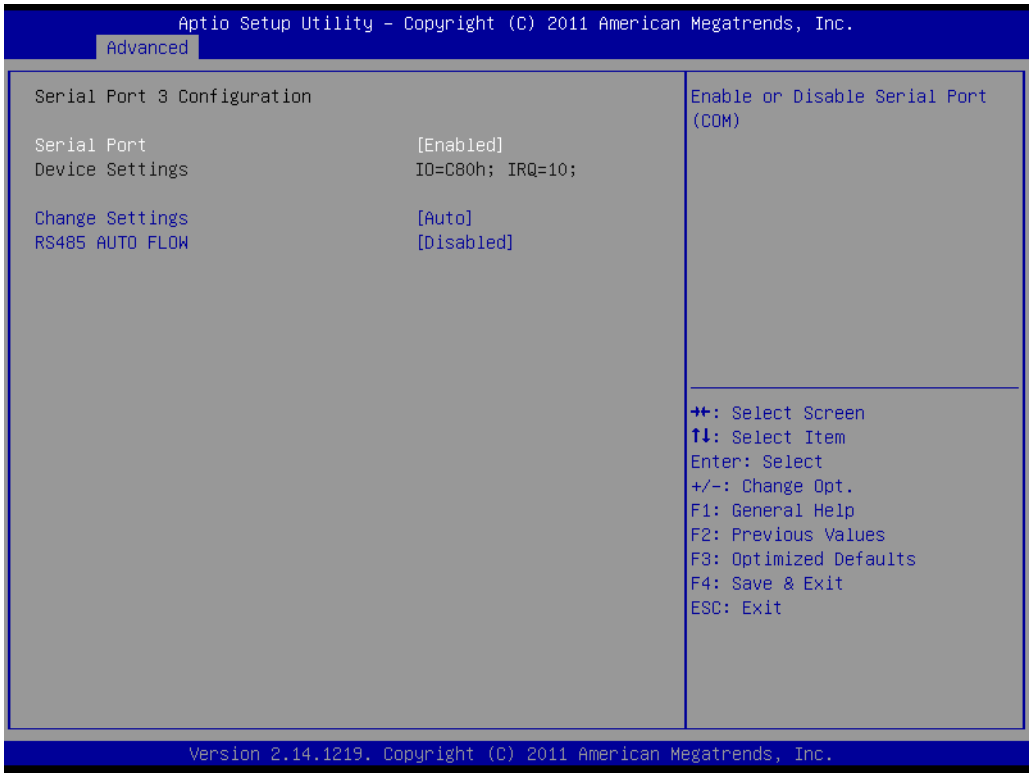
- **Serial Port**
  This item allows users to enable or disable Serial Port 2.
- **Change Settings**
  This item allows users to select the I/O address/IRQ setting for Serial Port 2.

Parallel Port Configuration



- **Parallel Port**
  This item allows users to enable or disable the Parallel Port.

Super IO Configuration



Serial Port 3 Configuration

- **Serial Port**

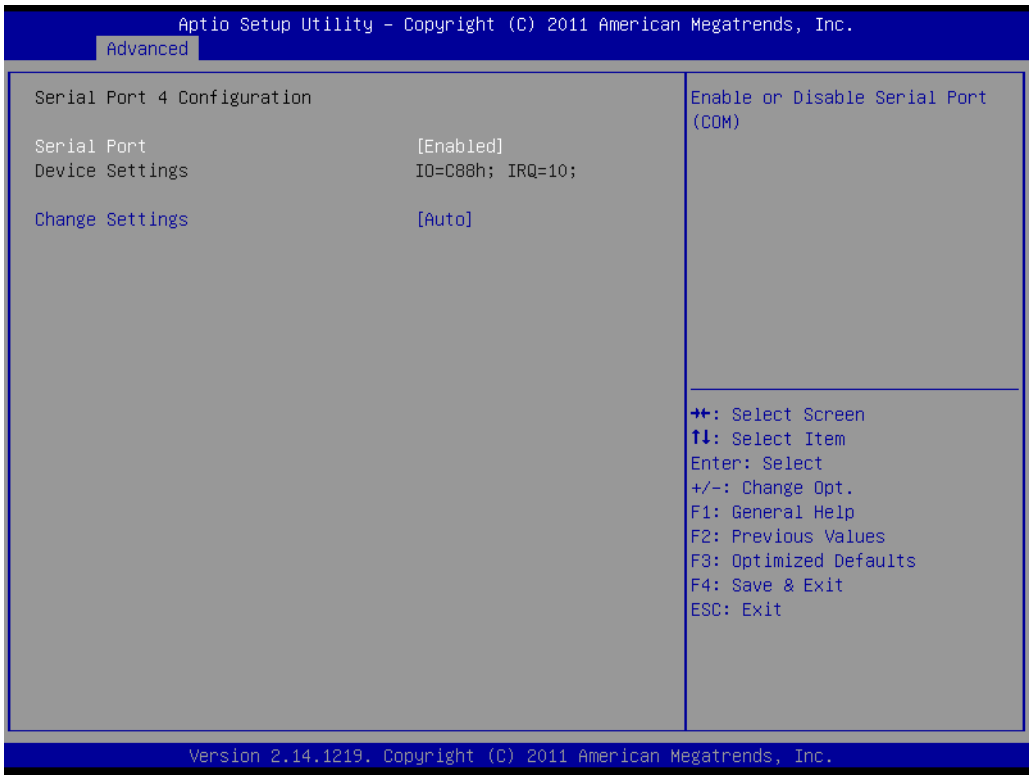
  This item allows users to enable or disable Serial Port 3.

- **Change Settings**

  This item allows users to select the I/O address/IRQ setting for Serial Port 3.

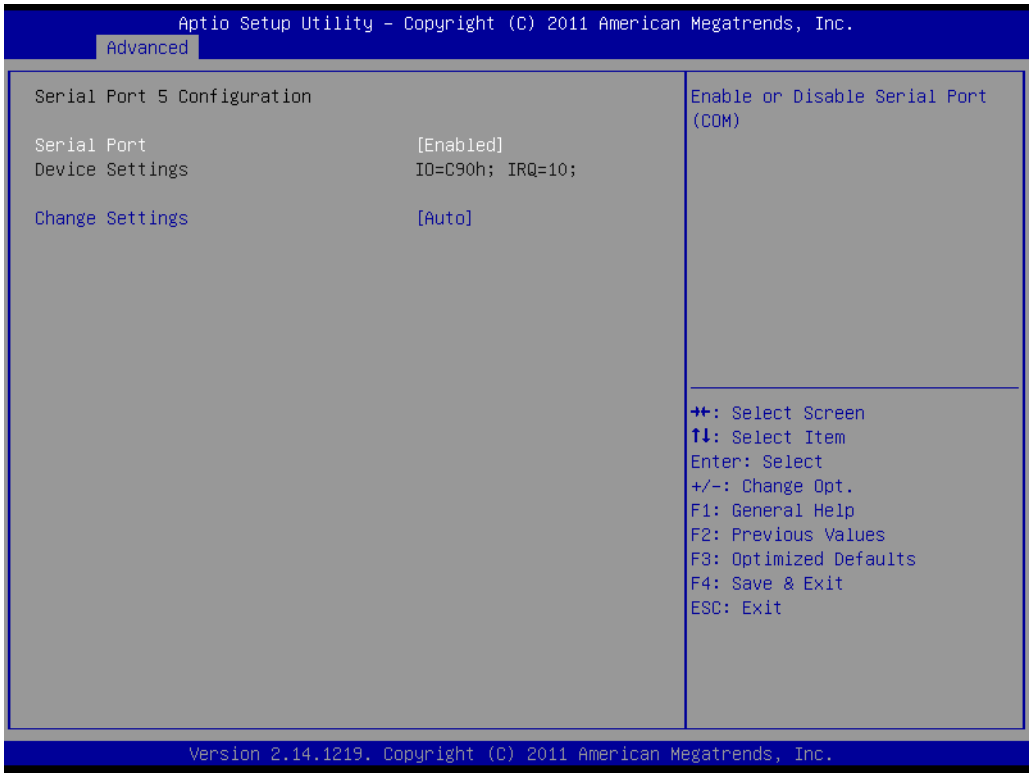
- **Auto Flow Control**

  This item supports the auto flow control function, when the COM is set as RS-485.



Serial Port 4 Configuration

- **Serial Port**
  This item allows users to enable or disable Serial Port 4.
- **Change Settings**
  This item allows users to select the I/O address/IRQ setting for Serial Port 4.



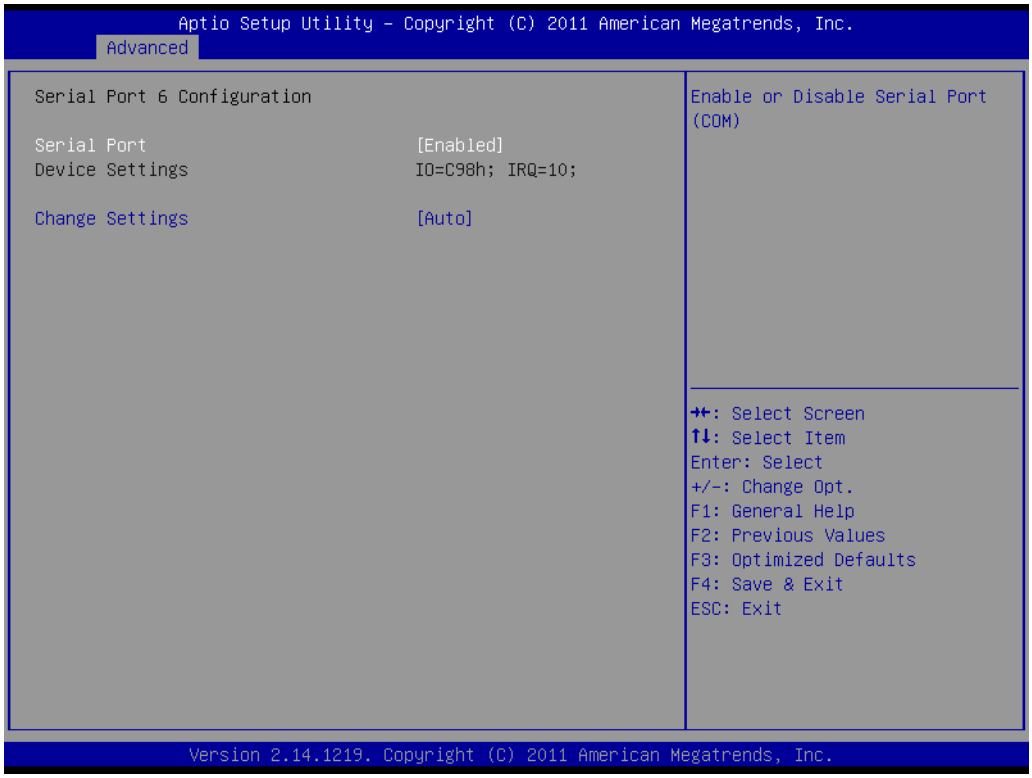
Serial Port 5 Configuration

- **Serial Port**

  This item allows users to enable or disable Serial Port 5.

- **Change Settings**

  This item allows users to select the I/O address/IRQ setting for Serial Port 5.



Serial Port 6 Configuration

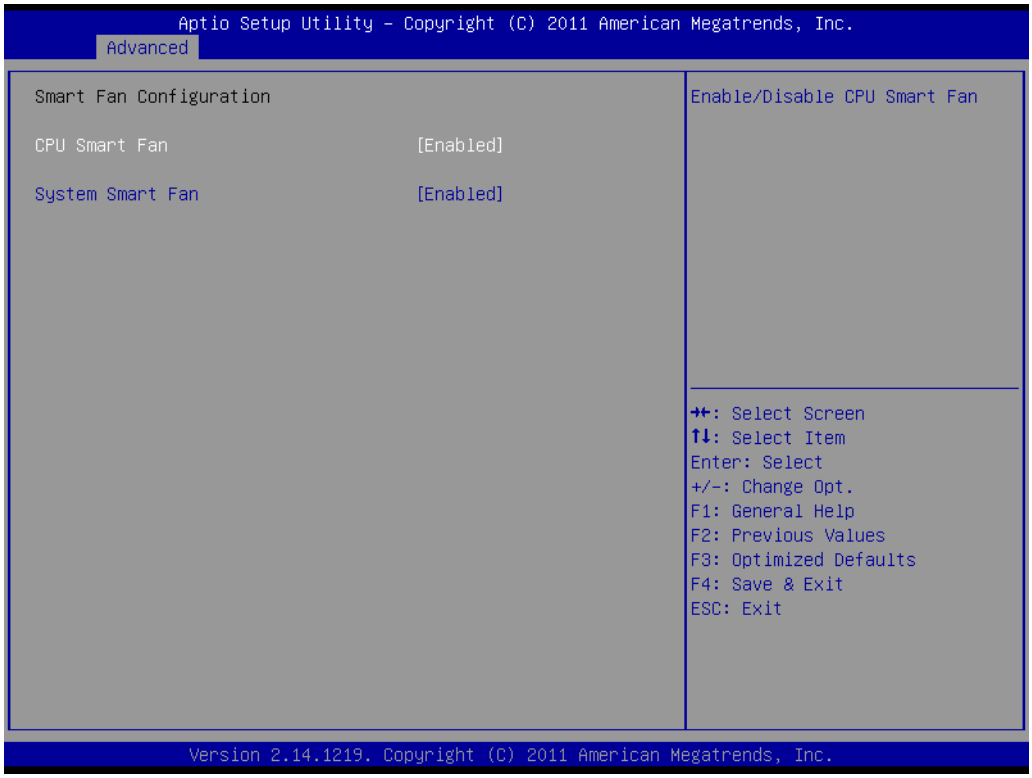
- **Serial Port**

  This item allows users to enable or disable Serial Port 6.

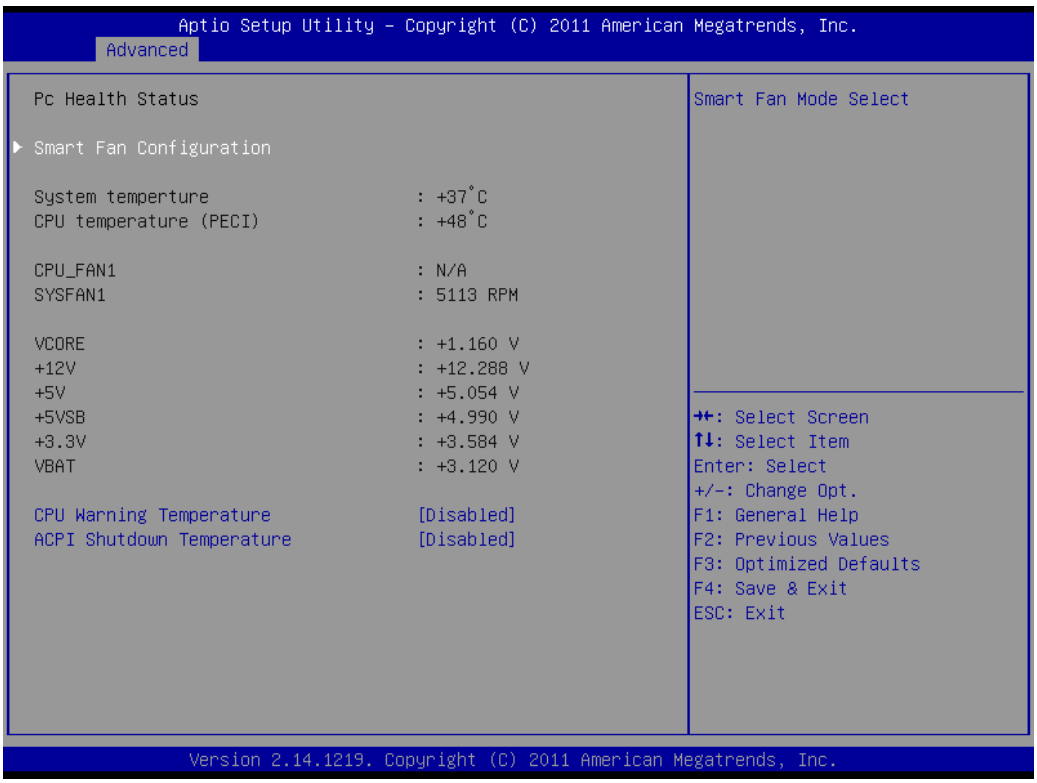
- **Change Settings**

  This item allows users to select the I/O address/IRQ setting for Serial Port 6.

3.3.10 Smart Fan Configuration



- **CPU Smart Fan**
  This item allows users to enable or disable the CPU smart fan.
- **System Smart Fan**
  This item allows users to enable or disable the system smart fan.



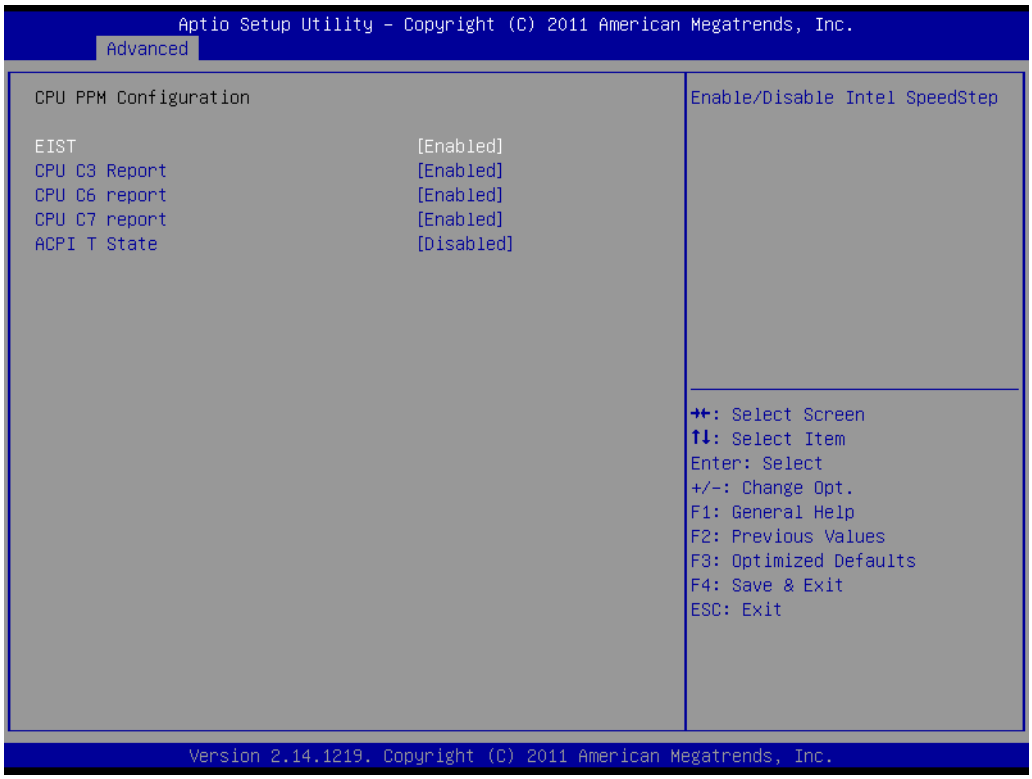
- **CPU Warning Temperature**

  This item allows users to set the CPU warning temperature threshold. When the system CPU reaches the specified temperature, an alarm will be emitted.

- **ACPI Shutdown Temperature**

  This item allows users to set the CPU temperature at which the system will automatically shutdown to protect the CPU from overheating damage.

3.3.11 CPU PPM Configuration



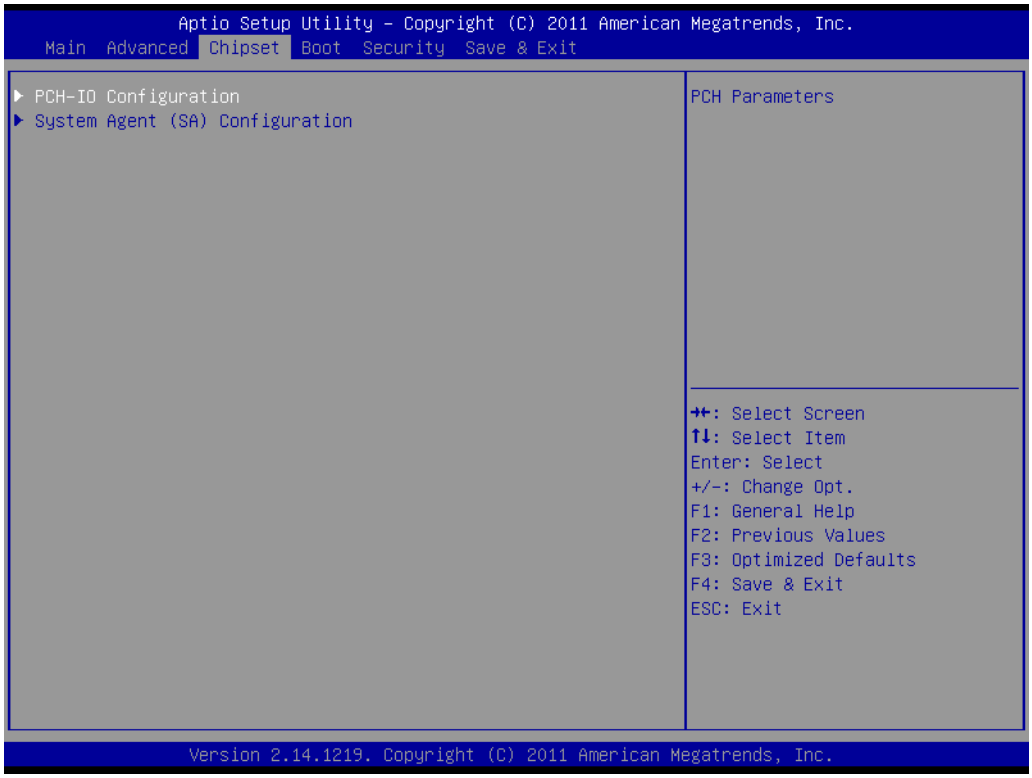
- **Enhanced Intel SpeedStep Technology (EIST)**
  This item allows users to enable or disable EIST. The CPU functions at default speed when disabled; when enabled, the CPU speed is controlled by the OS.
- **CPU C3/C6/C7 Report**
  This item allows users to enable or disable CPU C-state support.
- **ACPI T-State**
  This item allows users to enable or disable ACPI T-state function.

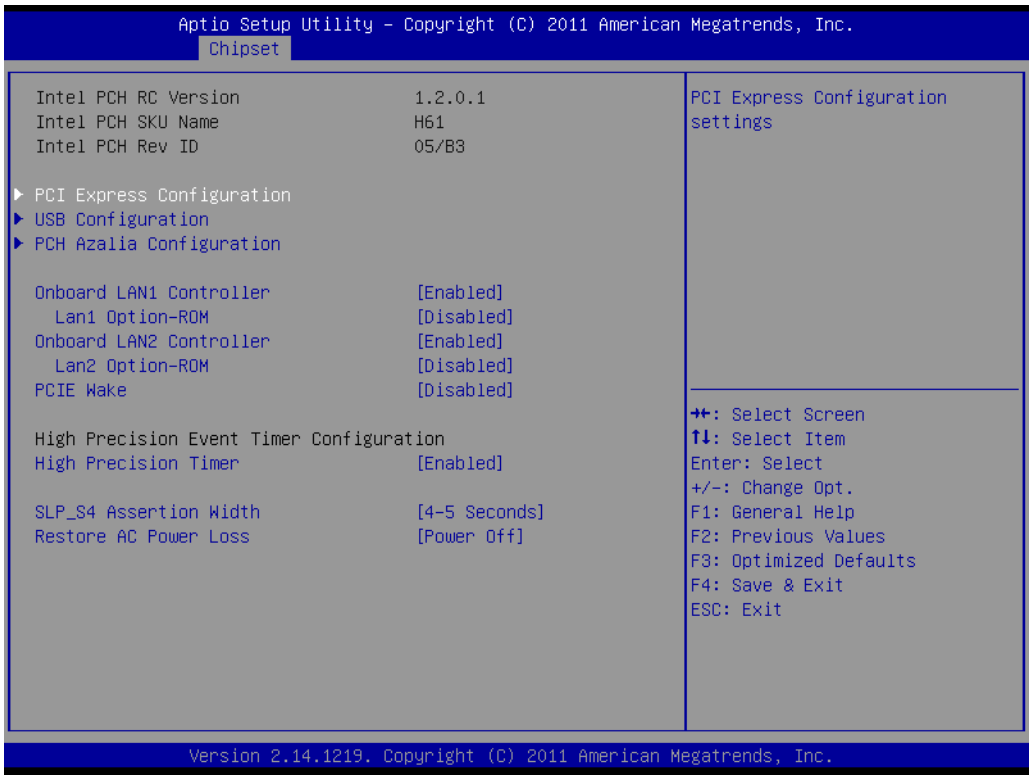
3.4 Chipset Configuration Setting

Select the Chipset tab from the BIOS setup screen to enter the Chipset setup screen. Users can select any item displayed in the left frame of the screen, such as PCI Express Configuration, to access the sub-menu for that item. The Chipset setup options can be reviewed by highlighting the item using the <Arrow> keys.

This section provides a description of all Chipset setup options as well as screen-shots of the Chipset setup page. The sub-menu items are also described in the following pages.

3.4.1 PCH-IO Configuration

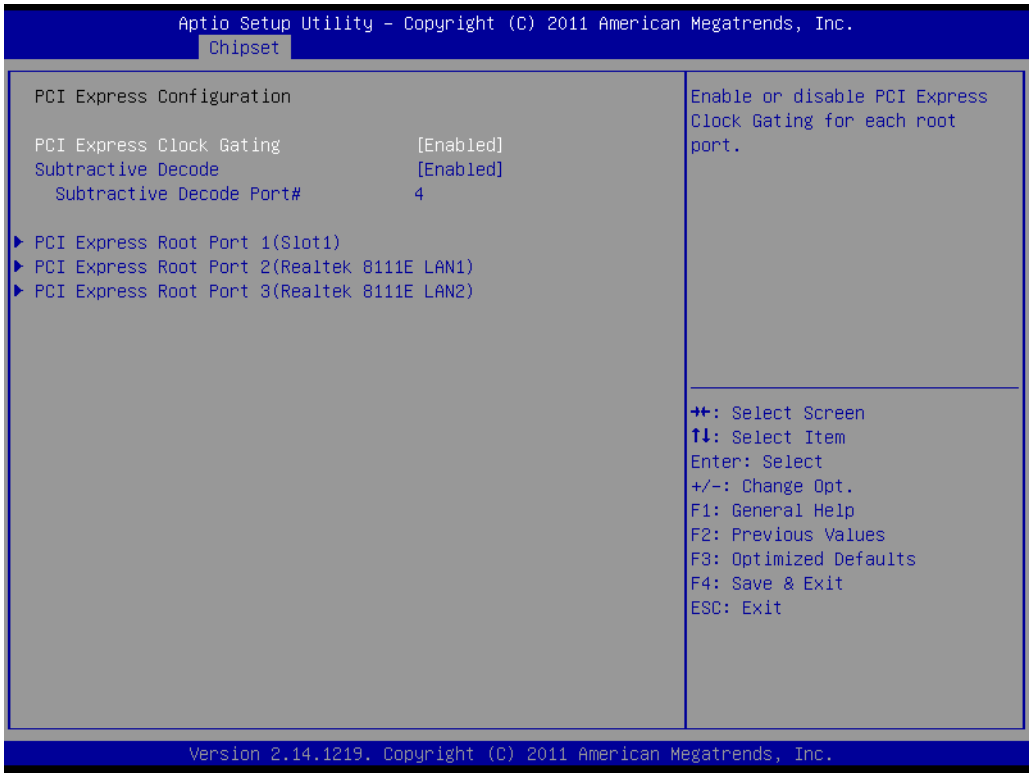

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
PCH-IO Configuration
System Agent (SA) Configuration
PCH Parameters
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.



- **PCI Express Configuration**
  This item allows users to adjust the PCI Express settings.
- **USB Configuration**
  This item allows users to adjust USB settings.
- **PCH Azalia Configuration**
  This item allows users to adjust the PCH Azalia settings.

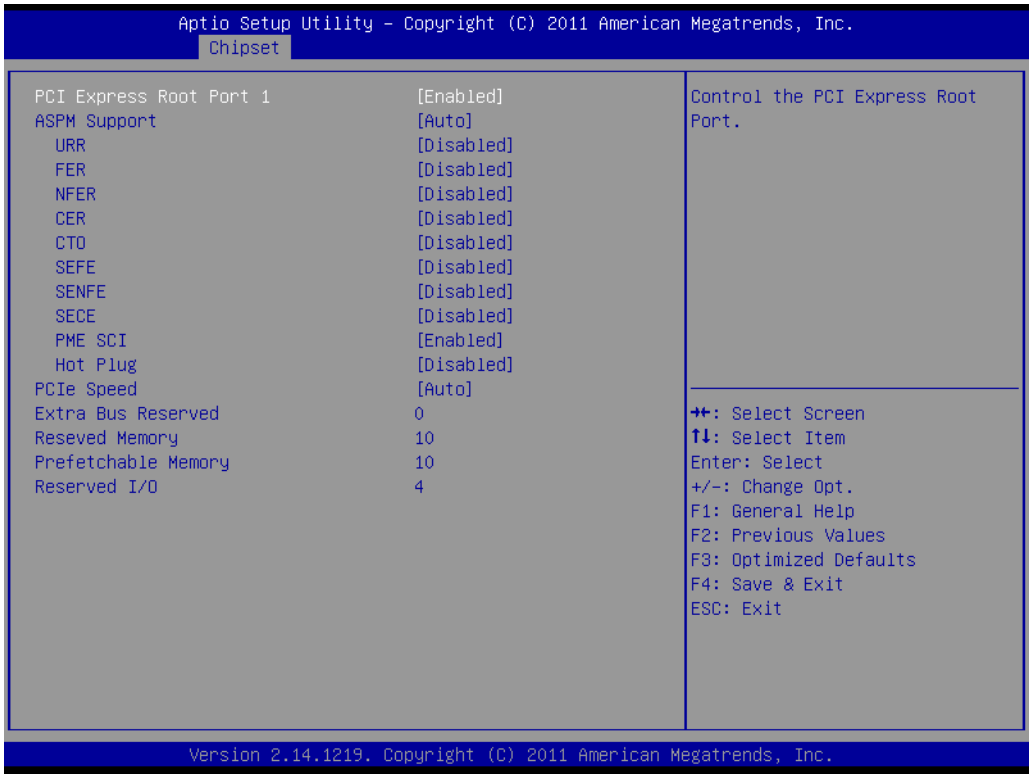
- **LAN Controller**
  This item allows users to enable or disable the LAN1/2 controller.
- **LAN Option-ROM**
  This item allows users to enable or disable the LAN1/2 option-ROM.
- **PCIE Wake**
  This item allows users to enable or disable the PCIE device wake-from-sleep-state function.
- **High Precision Timer**
  This item allows users to enable or disable the high precision timer.
- **SLP_S4 Assertion Width**
  This item allows users to set a delay.
- **Restore AC Power Loss**
  This item allows users to choose between Off, On, and Last State options to restore AC power loss.

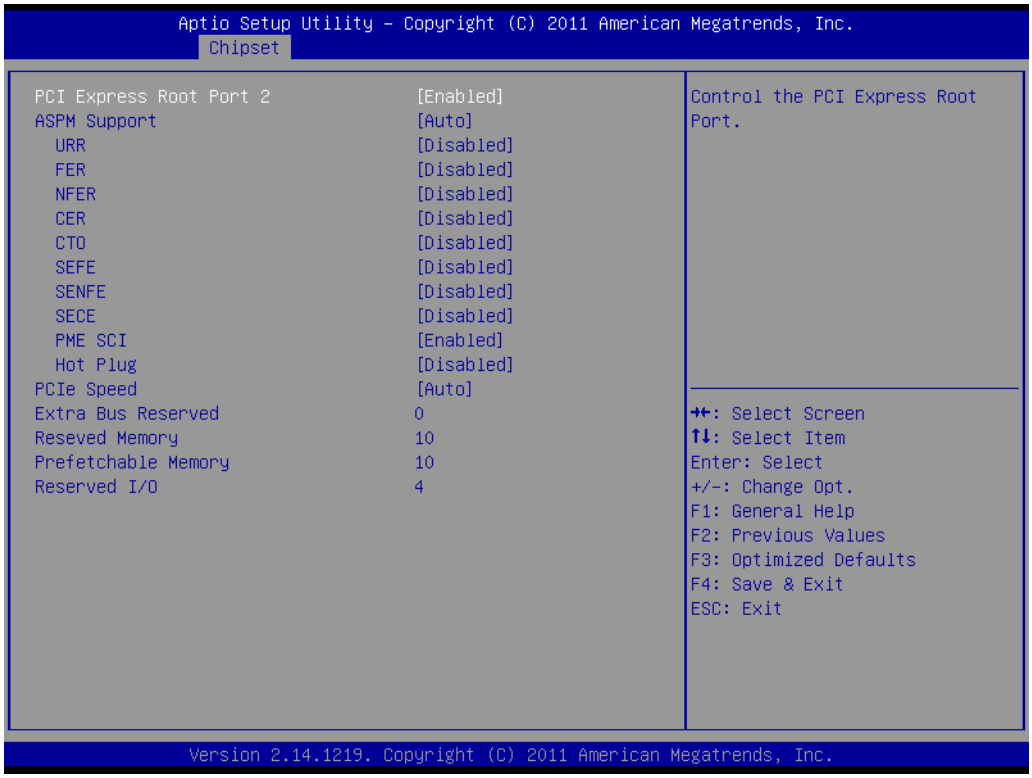
3.4.1.1 PCI Express Configuration

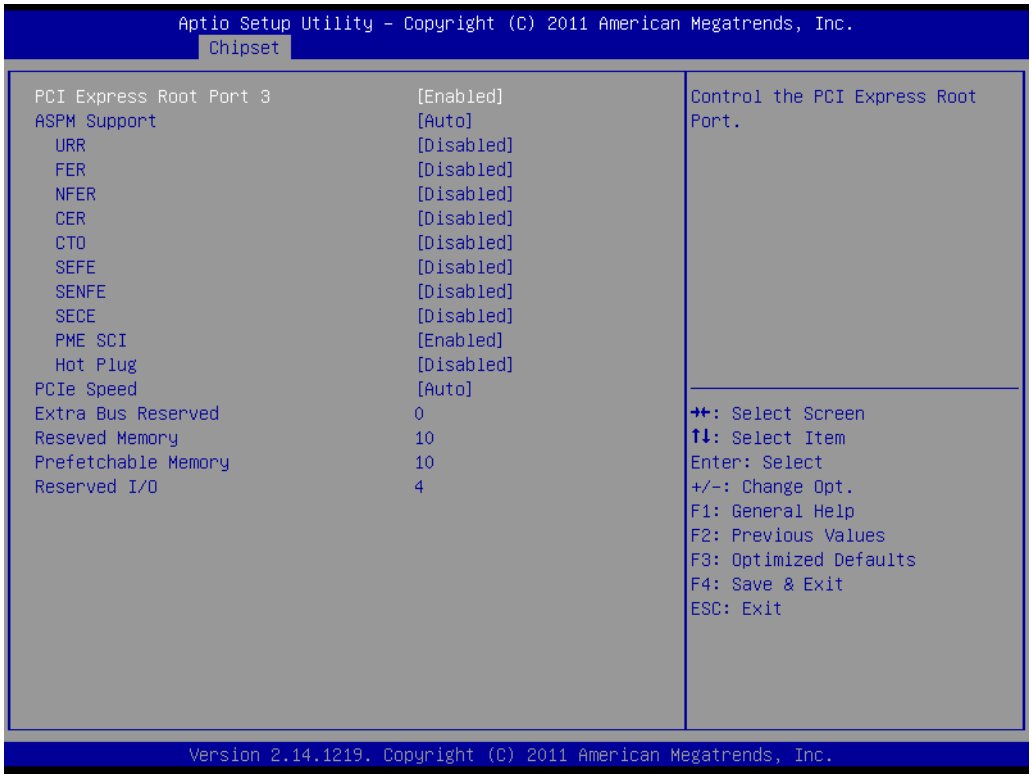

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Chipset
PCI Express Configuration
PCI Express Clock Gating [Enabled]
Subtractive Decode [Enabled]
Subtractive Decode Port# 4
PCI Express Root Port 1(Slot1)
PCI Express Root Port 2(Realtek 8111E LAN1)
PCI Express Root Port 3(Realtek 8111E LAN2)
Enable or disable PCI Express Clock Gating for each root port.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

- **PCI Express Clock Gating**
  This item allows users to enable or disable PCI express clock gating.
- **Subtractive Decode**
  This item allows users to enable or disable subtractive decoding.

3.4.1.2 PCI Express Root Port 1/2/3





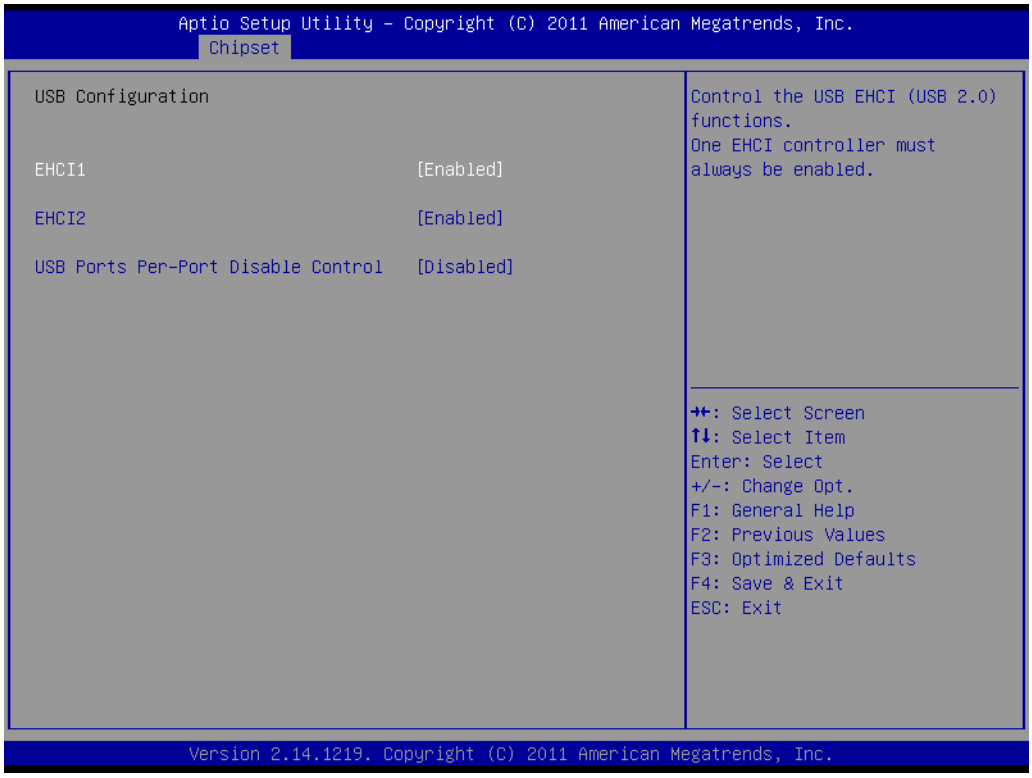


This page allows users to adjust the settings for PCI Express Root Ports 1, 2, and 3.

- **ASPM Support**
  This item allows users to set the ASPM level. The “Force L0s” option forces all links into the L0s state. The “Auto” option set the BIOS to auto configure. The “Disable” option disables ASPM.
- **URR**
  This item allows users to enable or disable PCIe Unsupported Request Reporting.
- **FER**
  This item allows users to enable or disable PCIe Fatal Error Reporting.
- **NFER**
  This item allows users to enable or disable PCIe Non-Fatal Error Reporting.
- **CER**
  This item allows users to enable or disable PCIe Correctable Error Reporting.
- **CTO**
  This item allows users to enable or disable PCIe Completion Timer TO.
- **SEFE**
  This item allows users to enable or disable Root PCIe System Error on Fatal Error.
- **SENFE**
  This item allows users to enable or disable Root PCIe System Error on Non-Fatal Error.
- **SECE**
  This item allows users to enable or disable Root PCIe System Error on Correctable Error.
- **PME SCI**
  This item allows users to enable or disable PCIe PME SCI.

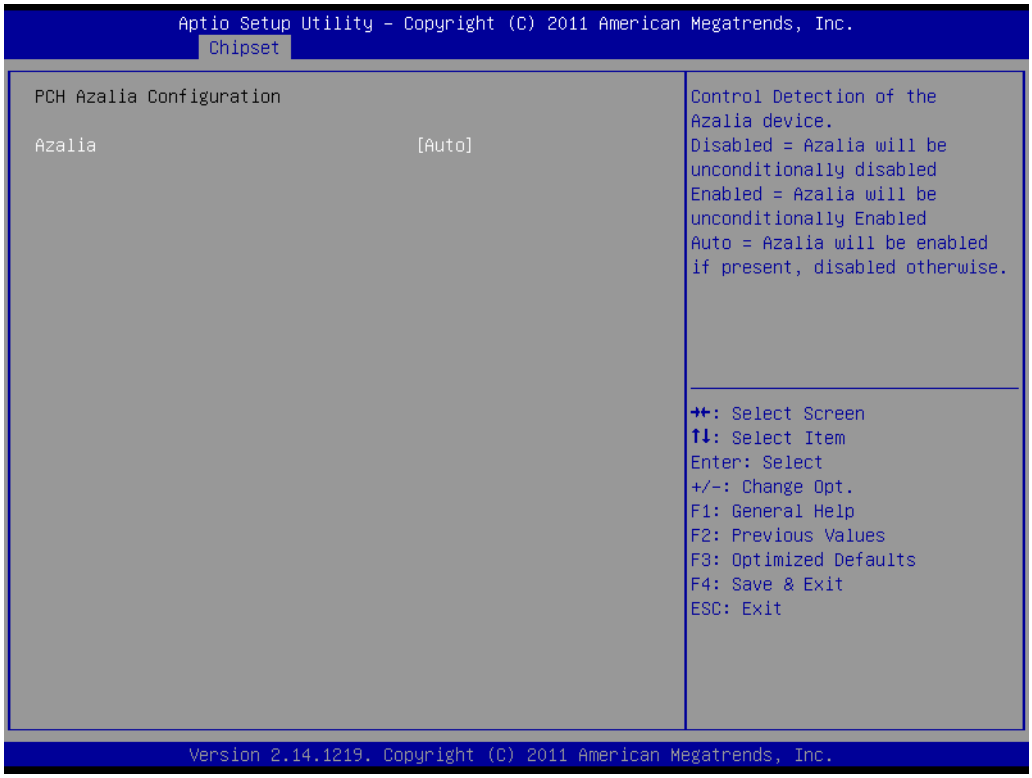
- **Hot Plug**
  This item allows users to enable or disable the PCIe Hot Plug.
- **PCIe Speed**
  This item allows users to select the PCIe port speed.
- **Extra Bus Reserved**
  This item allows users to configure Extra Bus Reserved for bridges behind the Root Bridge.
- **Reserved Memory**
  This item allows users to configure the Reserved Memory Range for the Root Bridge.
- **Prefetchable Memory**
  This item allows users to configure the Prefetchable Memory Range for the Root Bridge.
- **Reserved I/O**
  This item allows users to configure the Reserved I/O (4K/8K/12K/16K/20K) Range for the Root Bridge

3.4.2 USB Configuration



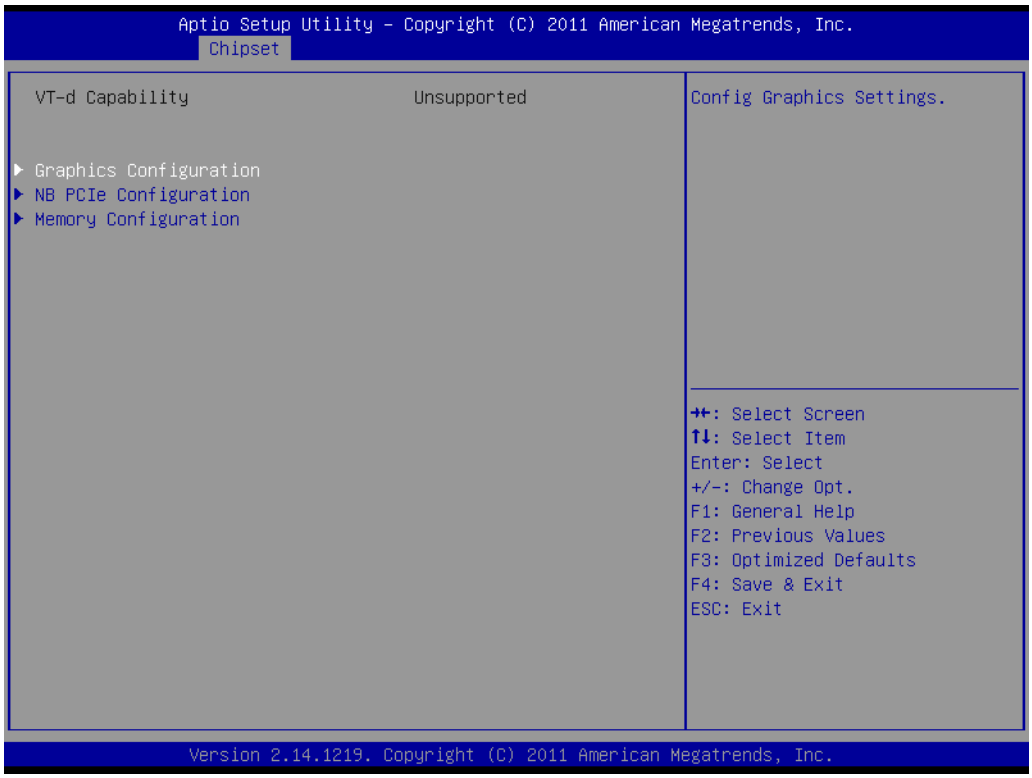
- **EHCI 1/2**
  This item allows users to enable or disable the EHCI controller.
- **USB Ports Pre-Port Disable Control**
  This item allows users to enable or disable each USB port individually.

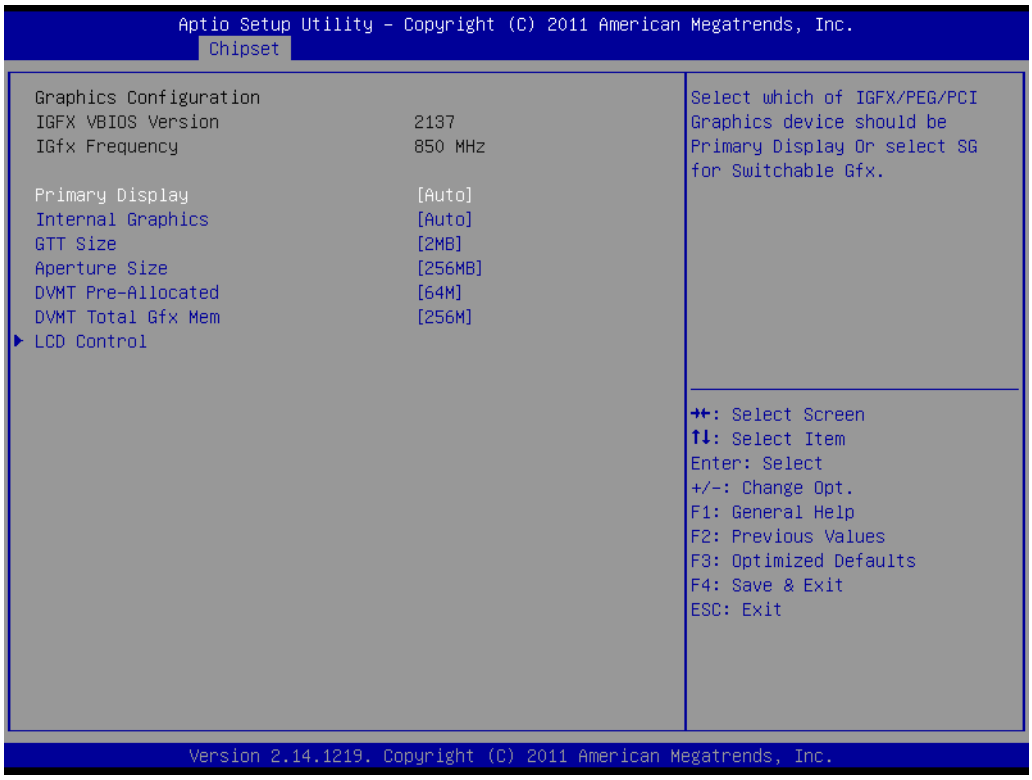
3.4.3 PCH Azalia Configuration


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Chipset
PCH Azalia Configuration
Azalia [Auto]
Control Detection of the Azalia device.
Disabled = Azalia will be unconditionally disabled
Enabled = Azalia will be unconditionally Enabled
Auto = Azalia will be enabled if present, disabled otherwise.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

- **Azalia**
  This item allows users to enable or disable Azalia devices.

3.4.4 System Agent Configuration




Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Chipset
Graphics Configuration
IGFX VBIOS Version 2137
IGfx Frequency 850 MHz
Primary Display [Auto]
Internal Graphics [Auto]
GTT Size [2MB]
Aperture Size [256MB]
DVMT Pre-Allocated [64M]
DVMT Total Gfx Mem [256M]
LCD Control
Select which of IGFX/PEG/PCI Graphics device should be Primary Display Or select SG for Switchable Gfx.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

- **Primary Display**
  This item allows users to select which graphics controller to use as the primary boot device.
- **Internal Graphics**
  This item allows users to enable or disable IGD.
- **GTT Size**
  This item allows users to set the GTT size.
- **Aperture Size**
  This item allows users to set the aperture size.
- **DVMT Pre-Allocated**
  This item allows users to set the DVMT pre-allocated memory size.
- **DVMT Total Gfx Mem**
  This item allows users to set the DVMT total memory size.
- **LCD Control**
  This item allows users to set the Display Control configuration.

3.4.4.1 LCD Control Configuration

Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Chipset
LCD Control
Primary IGFX Boot Display [VBIOS Default]
SDVO-LFP Panel Type [1024x 768 18bit]
Select the Video Device which will be activated during POST. This has no effect if external graphics present. Secondary boot display selection will appear based on your selection. VGA modes will be supported only on primary display
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

- **Primary IGFX Boot Display**

  This item allow users to select the video device to activate during the BIOS POST. The available options are VBIOS Default, VGA, LVDS, and DVI.

- **SDVO-LFP Panel Type**

  This item allow users to select between the following options:

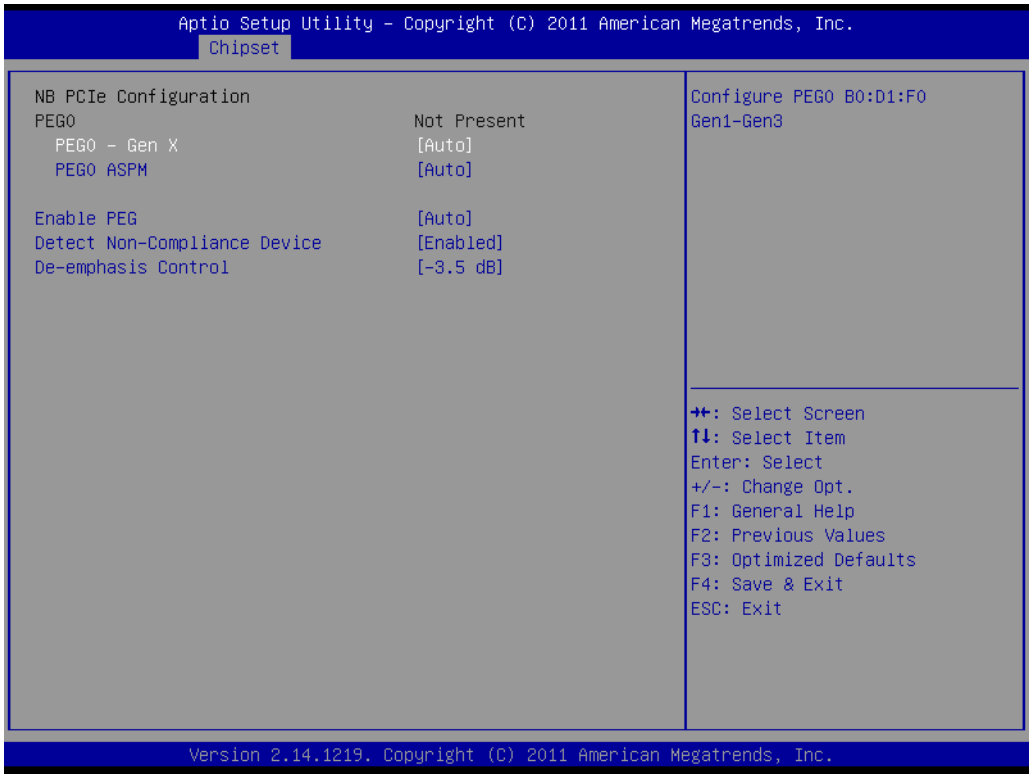
  1024 x 768 18-bit

  1024 x 768 24-bit

  1280 x 1024 48-bit

  1366 x 768 24-bit

3.4.5 NB PCIe Configuration



- **PEG0 - Gen x**

  This item allow users to set the PEG0 speed.

  – PEG0 ASPM=> Enable/Disable PEG0 ASPM function. (ASPM: Active State Power Management)

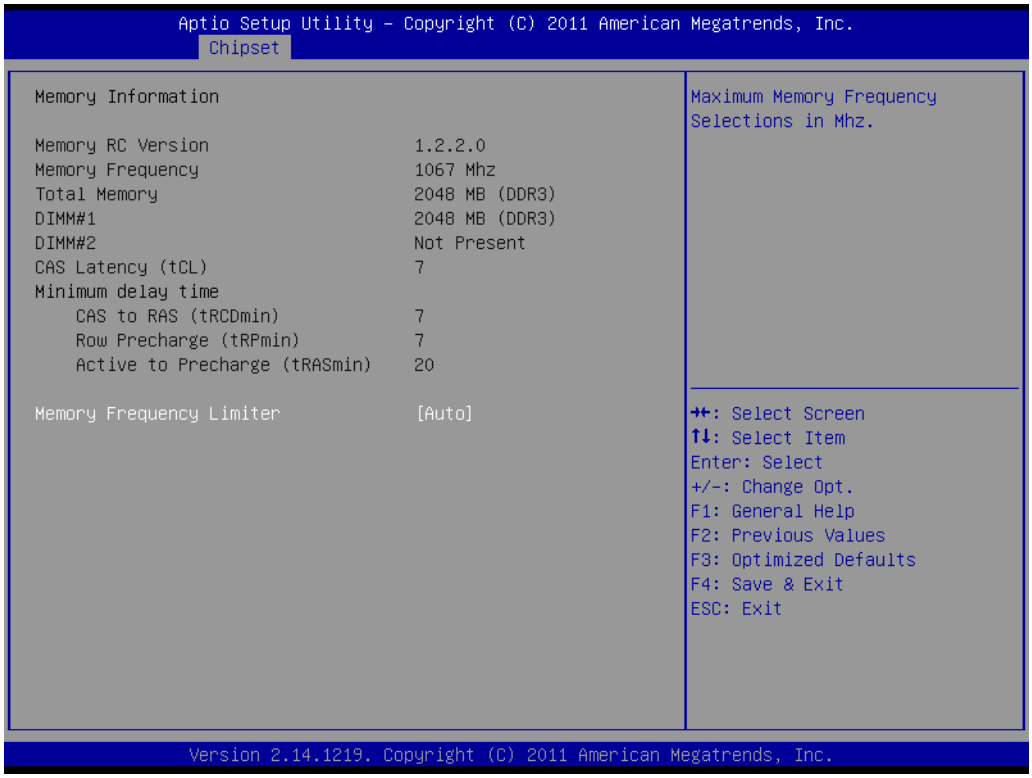
- **Enable PEG**

  This item allows users to enable or disable PEG.

- **Detect Non-Compliance Device**

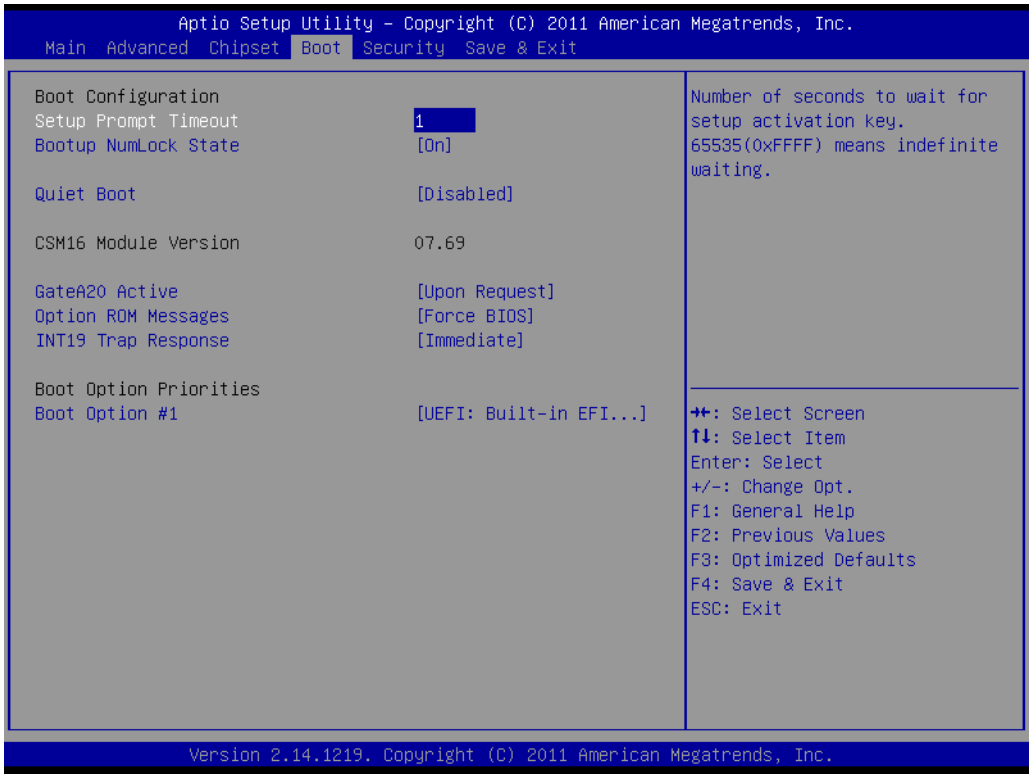
  This item allows users to enable or disable detection of non-compliant devices.

3.4.6 Memory Information



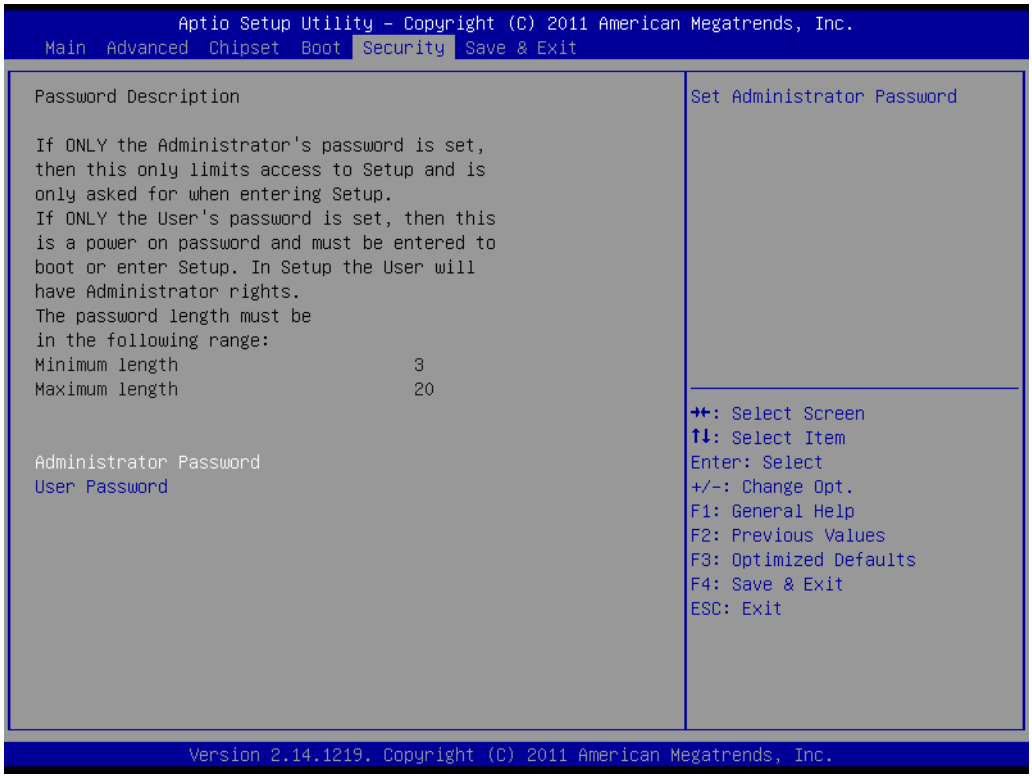
- **Memory Frequency Limiter**
  This item allow users to set the memory frequency limiter to Auto, 1067, 1333, or 1600.

3.5 Boot Configuration


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Boot Configuration
Setup Prompt Timeout 1
Bootup NumLock State [On]
Quiet Boot [Disabled]
CSM16 Module Version 07.69
GateA20 Active [Upon Request]
Option ROM Messages [Force BIOS]
INT19 Trap Response [Immediate]
Boot Option Priorities
Boot Option #1 [UEFI: Built-in EFI...]
Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

- **Setup Prompt Timeout**
  This item allows users to set the number of seconds to wait for a setup activation key.
- **Bootup NumLock State**
  This item allows users to select the Power On state for Numlock.
- **Quiet Boot**
  If this item is set to Disabled, the BIOS displays standard POST messages. If Enabled, an OEM Logo is shown instead of POST messages.
- **GateA20 Active**
  This item allows users to set access to Upon Request or Always Active.
- **Option ROM Messages**
  This item allows users to set the display mode for the option ROM.
- **INT19 Trap Response**
  This item allows users to set option ROMs to trap interrupt 19.
- **Boot Option Priorities NT19 Trap Response**
  This item allows users to set the system boot order.

3.6 Security Settings


Aptio Setup Utility – Copyright (C) 2011 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Password Description
If ONLY the Administrator's password is set, then this only limits access to Setup and is only asked for when entering Setup.
If ONLY the User's password is set, then this is a power on password and must be entered to boot or enter Setup. In Setup the User will have Administrator rights.
The password length must be in the following range:
Minimum length 3
Maximum length 20
Administrator Password
User Password
Set Administrator Password
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save & Exit
ESC: Exit
Version 2.14.1219. Copyright (C) 2011 American Megatrends, Inc.

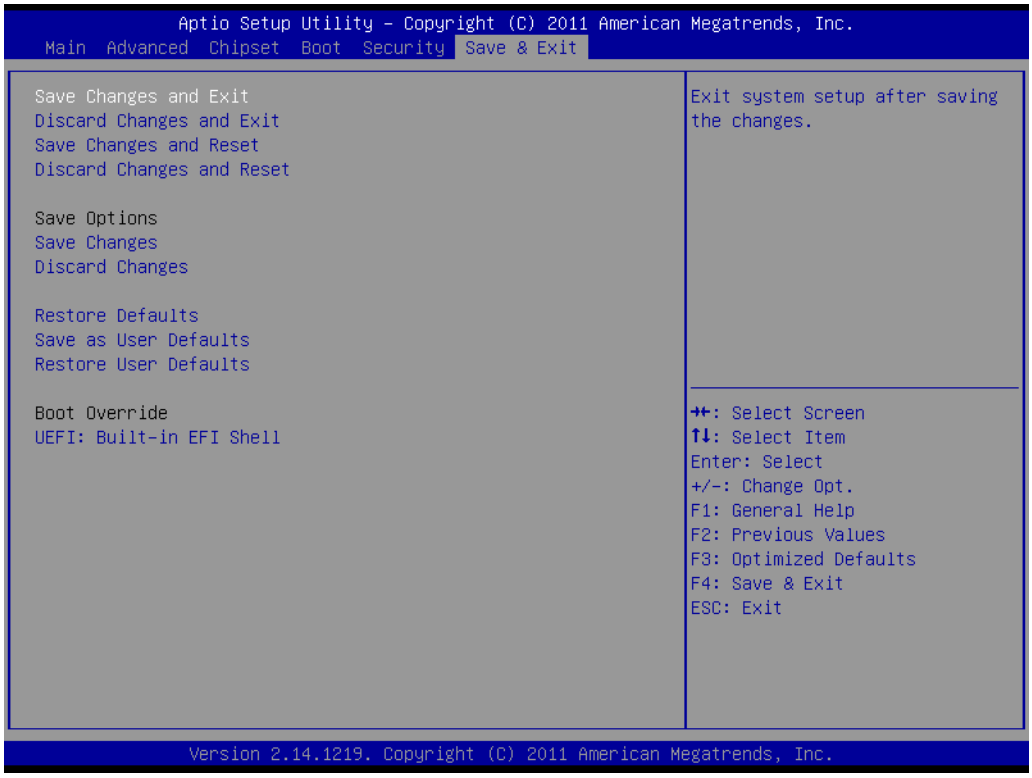
To access these options, select the Security tab from the main BIOS setup menu. All Security setup options, such as password protection and virus protection are described in this section. To access the sub menu for an item, select the item and press <Enter>.

- **Administrator Password**
  This item allows users to set the administrator password. Select the item and press <ENTER> to access the sub menu, and then type in a password.

- **User Password**

  This item allows users to set user passwords. Select the item and press <ENTER> to access the sub menu, and then type in a password.

3.7 Save & Exit Configuration



- **Save Changes and Exit**

  After completing the system configuration, select this option to save all changes and exit the BIOS setup menu. Next, reboot the computer to implement all system configuration parameters.

1. Select the “Exit and Save Changes” option in the Exit menu and press <Enter>. The following message will appear: Save Configuration Changes and Exit Now? [Ok] [Cancel]
2. Select “Ok” or “Cancel”.

- **Discard Changes and Exit**

  Select this item to quit the setup menu without making permanent changes to the system configuration.

1. Select the “Exit and Discard Changes” option in the Exit menu and press <Enter>. The following message will appear: Discard Changes and Exit Setup Now? [Ok] [Cancel]
2. Select “Ok” to discard changes and exit. Alternatively, select “Discard Changes” from the Exit menu and press <Enter> to discard the changes without exiting.

- **Restore Defaults**

  The BIOS automatically configures all setup items to their optimal settings when this option is selected. Defaults are designed to maximize system performance, but may not be ideal for all computer applications. For example, default settings should not be used if the computer is experiencing system configuration problems. Otherwise, select the “Restore Defaults” option from the Exit menu and press <Enter>.

- **Save as User Defaults**
  This item allows users to save all current settings as user defaults.
- **Restore User Defaults**
  This item allows users to restore all settings to the user default values.
- **Boot Override**
  This item allows users to view the boot device types on the system.

Chapter 4

Chipset Software Installation Utility

4.1 Before Beginning

To facilitate the installation of the enhanced display drivers and utility software, read the instructions in this chapter carefully. The drivers for AIMB-281 are located on the software installation CD. The driver in the folder of the driver CD will guide and link users to the utilities and drivers under a Windows system. Updates are provided via Microsoft* service packs.

Note! *The files on the software installation CD are compressed. Do not attempt to install the drivers by copying the files manually. The setup program provided must be used to install the drivers.*

Users are reminded that most display drivers require the installation of relevant software applications prior to installing enhanced display drivers. Additionally, many installation procedures assume familiarity with both the relevant software applications and operating system commands. Users are advised to review the relevant operating system commands and pertinent sections of the application software's user manual before conducting the installation.

4.2 Introduction

The Intel Chipset Software Installation (CSI) utility installs the Windows INF files that inform the operating system of how the chipset components will be configured. This is necessary to ensure the correct function of the following features:

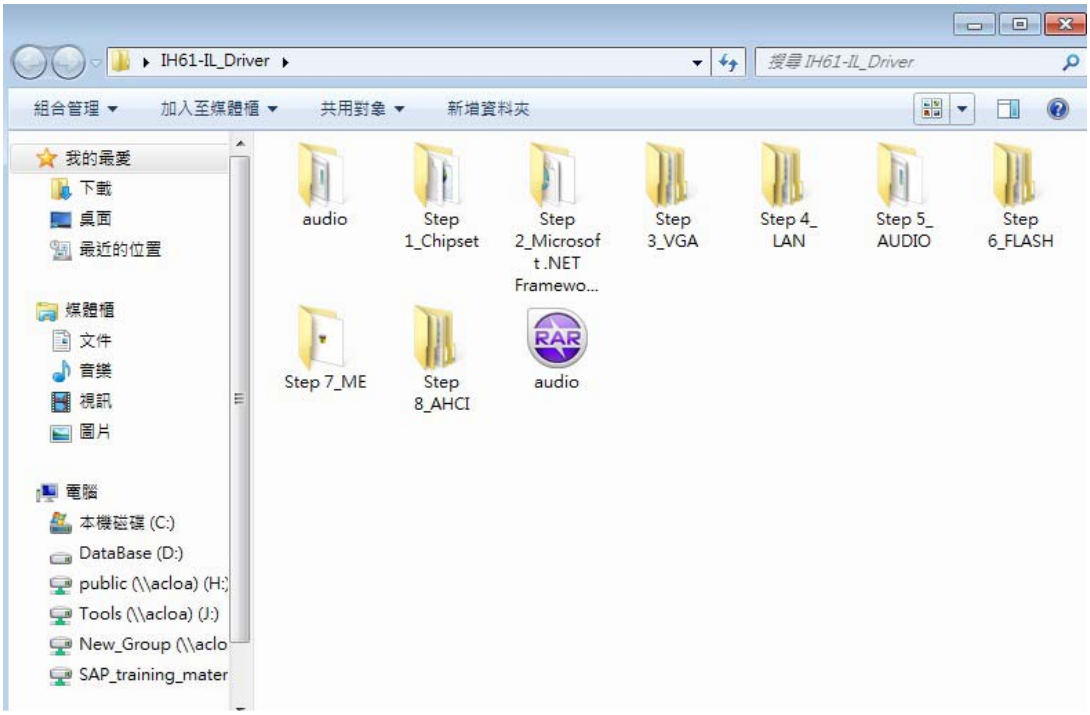
- Core PCI PnP services
- IDE Ultra ATA 100/66/33 and Serial ATA interface support
- USB 1.1/2.0 support (USB 2.0 driver must be installed separately for Win98)
- Identification of Intel chipset components in the Device Manager

Note! *This utility is suitable for the versions of Windows listed below, and must be installed **before** installing the other drivers:*

- *Windows 7 (32-bit)*
- *Windows 7 (64-bit)*
- *Windows XP professional edition (32-bit)*
- *Windows XP professional edition (64-bit)*

4.3 Windows XP/Windows 7 Driver Setup

1. Insert the driver CD into the system's CD-ROM drive. Navigate to the folder labeled "Intel chip", open the folder, and double click on "Setup.exe" to complete the driver installation.



Chapter 5

VGA Setup

5.1 Introduction

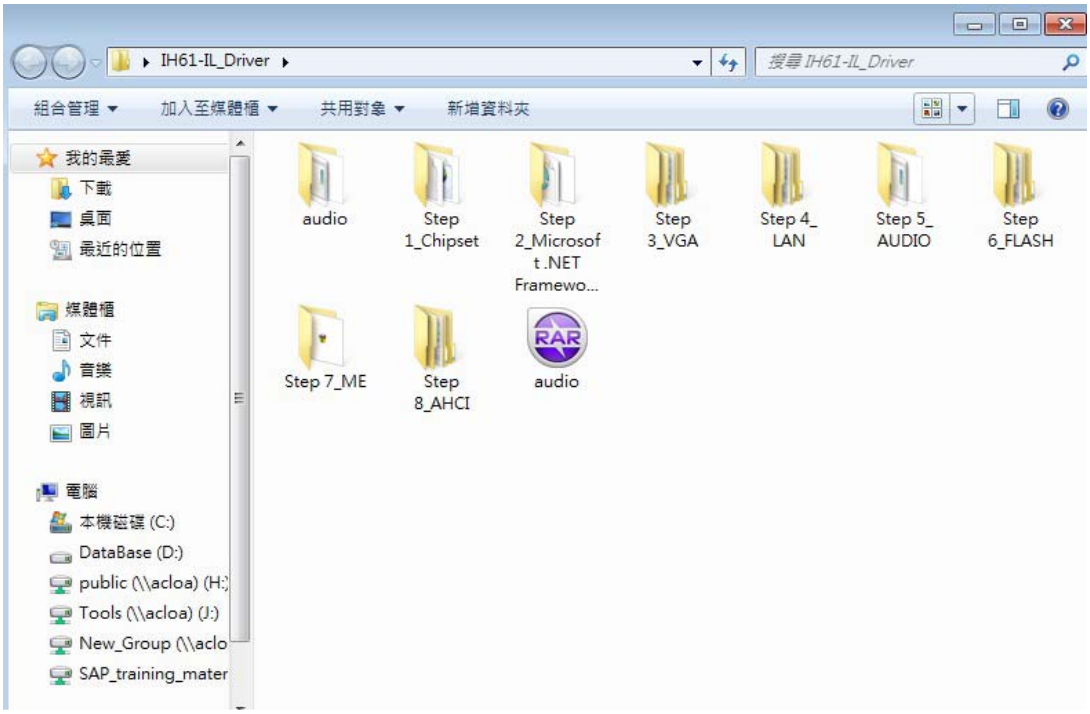
The Intel Core i7-3770, Core i5-3550S, Core i3-3220, Core i7-2600, Core i5-3570, Core i5-3450, Core i5-2500T, Core i3-2125, Core i3-3220, Xeon E3-1275, Xeon E3-1225, Pentium G620, Celeron G460, Core i3-2120, Pentium G850, Celeron G540 CPUs with dual cores are embedded with an integrated graphics controller. However, a VGA driver must be installed to enable this function.

Optimized integrated graphics solution: Intel's flexible graphics technology supports versatile display options, a 32-bit 3D graphics engine, dual independent displays, and enhanced display modes for widescreen flat panels, including extended, twin, and clone dual display modes. These features combined with optimized 3D support ensure that AIMB-281 delivers a vivid yet realistic visual experience.

5.2 Windows 7/XP

Note! *Before installing this driver, ensure that the CSI utility has been installed. See Chapter 5 for information on installing the CSI utility.*

Insert the driver CD into the system's CD-ROM drive. Navigate to the "Intel Graphics" folder and double click "Setup.exe" to complete the driver installation for Windows 7 and XP.



Chapter 6

LAN Configuration

6.1 Introduction

AIMB-281 features dual Gigabit Ethernet LANs via dedicated PCIe x1 lanes (Realtek RTL8111E-VL (LAN1) and Realtek RTL8111E-VL (LAN2)) that offer a bandwidth of up to 500 MB/sec, eliminating network data bottlenecks and incorporating Gigabit Ethernet at 1000 Mbps.

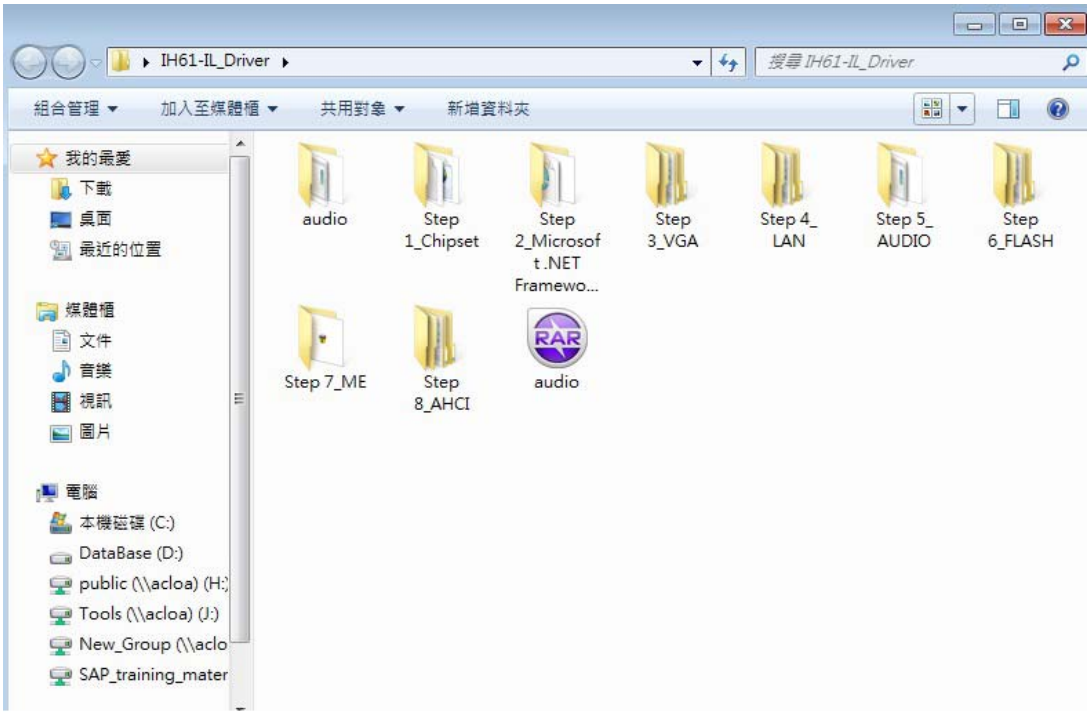
6.2 Installation

Note! *Before installing the LAN drivers, ensure that the CSI utility has been installed. See Chapter 5 for information on installing the CSI utility.*

The AIMB-281's Realtek RTL8111E-VL (LAN1) and Realtek RTL8111E-VL (LAN2) Gigabit integrated controllers support all major network operating systems. However, the installation procedure varies between systems. Identify the section detailing the driver setup procedures for your specific operating system and follow the instructions provided.

6.3 Windows® 7/XP Driver Setup (Realtek RTL8111E-VL)

Insert the driver CD into the system's CD-ROM drive. Open the "LAN" folder and navigate to the appropriate directory for your OS.



Appendix A

Programming the Watchdog Timer

A.1 Programming the Watchdog Timer

AIMB-281's watchdog timer can be used to monitor the system software operation and initiate corrective action if the software fails within the allocated period.

This section describes the operation of the watchdog timer and how to program it.

A.1.1 Watchdog Timer Overview

The watchdog timer is built into the super I/O controller Nuvoton NCT6776F, and provides the following user-programmable functions:

- Controllable via a user program
- Timer can be set from 1 to 255 seconds or 1 to 255 minutes
- Generates an interrupt or reset signal if the software fails to reset the timer before timeout.

A.1.2 Programming the Watchdog Timer

The I/O port address for the watchdog timer is 2E (hex) and 2F (hex). Specifically, 2E (hex) is the address port, and 2F (hex) is the data port. Users must first assign a register address by writing an address value into address port 2E (hex), and then write/read data to/from the assigned register through data port 2F (hex).

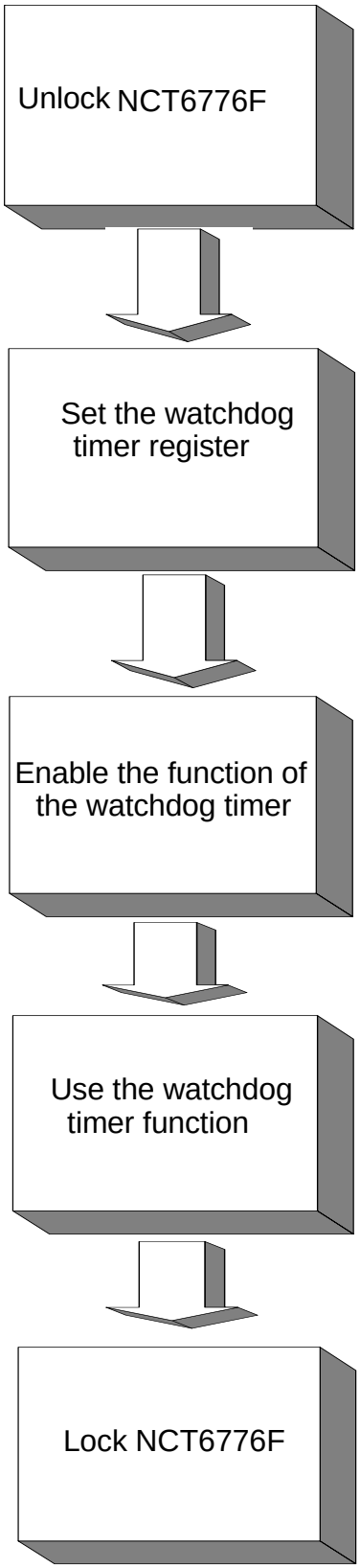

Unlock NCT6776F
Set the watchdog timer register
Enable the function of the watchdog timer
Use the watchdog timer function
Lock NCT6776F

Table A.1: Watchdog Timer Registers

Address of Register (2E)	Attribute	
Read/Write	Value (2F) & description	
87 (hex)	-----	Write this address to I/O address port 2E (hex) twice to unlock NCT6776F.
07 (hex)	write	Write 08 (hex) to select the watchdog timer register.
30 (hex)	write	Write 01 (hex) to enable the watchdog timer function. The default setting is Disabled.
F5 (hex)	write	Set seconds or minutes as units for the timer. Write 0 to Bit 3: set seconds as the counting unit. [default] Write 1 to Bit 3: set minutes as the counting unit.
F6 (hex)	write	0: stop timer [default] 01~FF (hex): The value, in seconds or minutes, depends on the value set in register F5 (hex). This number decides how long the watchdog timer waits for strobe before generating an interrupt or reset signal. Writing a new value to this register can reset the timer to count with the new value.
F7 (hex)	read/write	Bit 7: Write 1 to enable the mouse to reset the timer, 0 to disable[default]. Bit 6: Write 1 to enable the keyboard to reset the timer, 0 to disable[default]. Bit 5: Write 1 to generate a timeout signal immediately and automatically return to 0 [default = 0]. Bit 4: Read status of watchdog timer, 1 means “timeout”.
AA (hex)	-----	Write this address to I/O port 2E (hex) to lock Watchdog Timer 2.

A.1.3 Example Program

1. Enable watchdog timer and set the timeout interval as 10 seconds

```
;--------------------------------------------------------
Mov dx,2eh; Unlock NCT6776F
Mov al,87h
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h; Select the watchdog timer registers
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;--------------------------------------------------------
Dec dx; Enable the watchdog timer function
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;--------------------------------------------------------
Dec dx; Set seconds as the counting unit
Mov al,0f5h
Out dx,al
Inc dx
In al,dx
And al,not 08h
Out dx,al
;--------------------------------------------------------
Dec dx; Set the timeout interval as 10 seconds and start counting
Mov al,0f6h
Out dx,al
Inc dx
Mov al,10
Out dx,al
;--------------------------------------------------------
Dec dx; Lock NCT6776F
Mov al,0aah
Out dx,al
```

2. Enable the watchdog timer and set the timeout interval as 5 minutes

```
;--------------------------------------------------------
Mov dx,2eh; Unlock NCT6776F
Mov al,87h
Out dx,al
Out dx,al
```

```
;--------------------------------------------------------
Mov al,07h; Select the watchdog timer registers
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;--------------------------------------------------------
Dec dx; Enable the watchdog timer function
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;--------------------------------------------------------
Dec dx; Set minutes as the counting unit
Mov al,0f5h
Out dx,al
Inc dx
In al,dx
Or al,08h
Out dx,al
;--------------------------------------------------------
Dec dx; Set the timeout interval as 5 minutes and start counting
Mov al,0f6h
Out dx,al
Inc dx
Mov al,5
Out dx,al
;--------------------------------------------------------
Dec dx; Lock NCT6776F
Mov al,0aah
Out dx,al
```

3. Enable the watchdog timer to be reset using a mouse

```
;--------------------------------------------------------
Mov dx,2eh; Unlock NCT6776F
Mov al,87h
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h; Select the watchdog timer registers
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;--------------------------------------------------------
```

```
Dec dx; Enable the watchdog timer function
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;--------------------------------------------------------
Dec dx; Enable the watchdog timer to be reset using a mouse
Mov al,0f7h
Out dx,al
Inc dx
In al,dx
Or al,80h
Out dx,al
;--------------------------------------------------------
Dec dx; Lock NCT6776F
Mov al,0aah
Out dx,al
```

4. Enable the watchdog timer to be reset via the keyboard

```
;--------------------------------------------------------
Mov dx,2eh; Unlock NCT6776F
Mov al,87h
Out dx,al
Out dx,al
;--------------------------------------------------------
Mov al,07h; Select the watchdog timer registers
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;--------------------------------------------------------
Dec dx; Enable the watchdog timer function
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;--------------------------------------------------------
Dec dx; Enable the watchdog timer to be strobed reset via the keyboard
Mov al,0f7h
Out dx,al
Inc dx
In al,dx
Or al,40h
Out dx,al
```

```
;------------------------------------------------------------
Dec dx; Lock NCT6776F
Mov al,0aah
Out dx,al
```

5. Generate a timeout signal without the timer counting

```
;------------------------------------------------------------
Mov dx,2eh; Unlock NCT6776F
Mov al,87h
Out dx,al
Out dx,al
;------------------------------------------------------------
Mov al,07h; Select the watchdog timer registers
Out dx,al
Inc dx
Mov al,08h
Out dx,al
;------------------------------------------------------------
Dec dx; Enable the watchdog timer function
Mov al,30h
Out dx,al
Inc dx
Mov al,01h
Out dx,al
;------------------------------------------------------------
Dec dx; Generate a timeout signal
Mov al,0f7h
Out dx,al; Write 1 to Bit 5 of F7 register
Inc dx
In al,dx
Or al,20h
Out dx,al
;------------------------------------------------------------
Dec dx; Lock NCT6776F
Mov al,0aah
Out dx,al
```

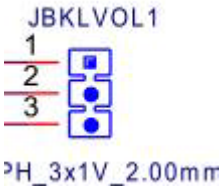
Appendix B

Jumper Settings & Connector List

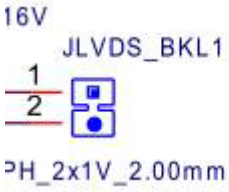
B.1 Jumper Settings

1. Backlight voltage level
2. Panel brightness control
3. COM - RS232/RS422/RS485
4. Clear CMOS
5. AT/ATX mode select

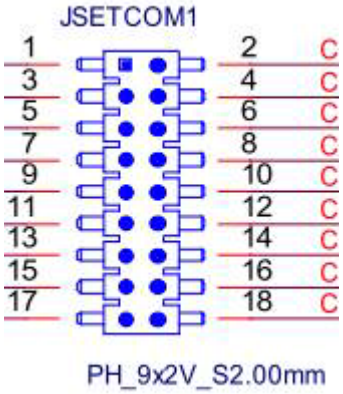
JBKLVOL1 Backlight Voltage Level	
Setting	**Function**
1-2	5V (default)
2-3	3.3V

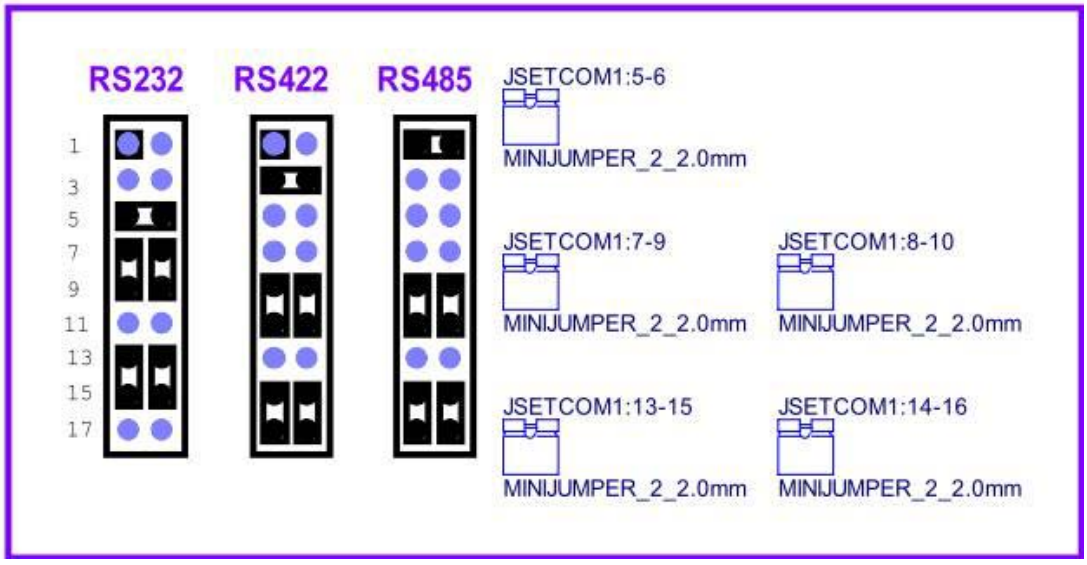


JLVDS_VBR1 Panel Brightness Control	
Setting	**Function**
1-2	Linear brightness control (default)
NC	PWM brightness control

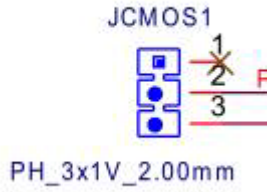


COM RS232/RS422/RS485	
Setting	As shown below

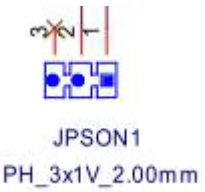


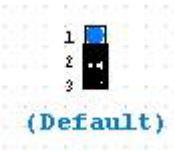


JCOMS1	Clear CMOS
Setting	**Function**
1-2	Default
2-3	Clear CMOS.



JPSON1	AT/ATX Mode Select
Setting	**Function**
1-2	AT mode
2-3	ATX mode (default)





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